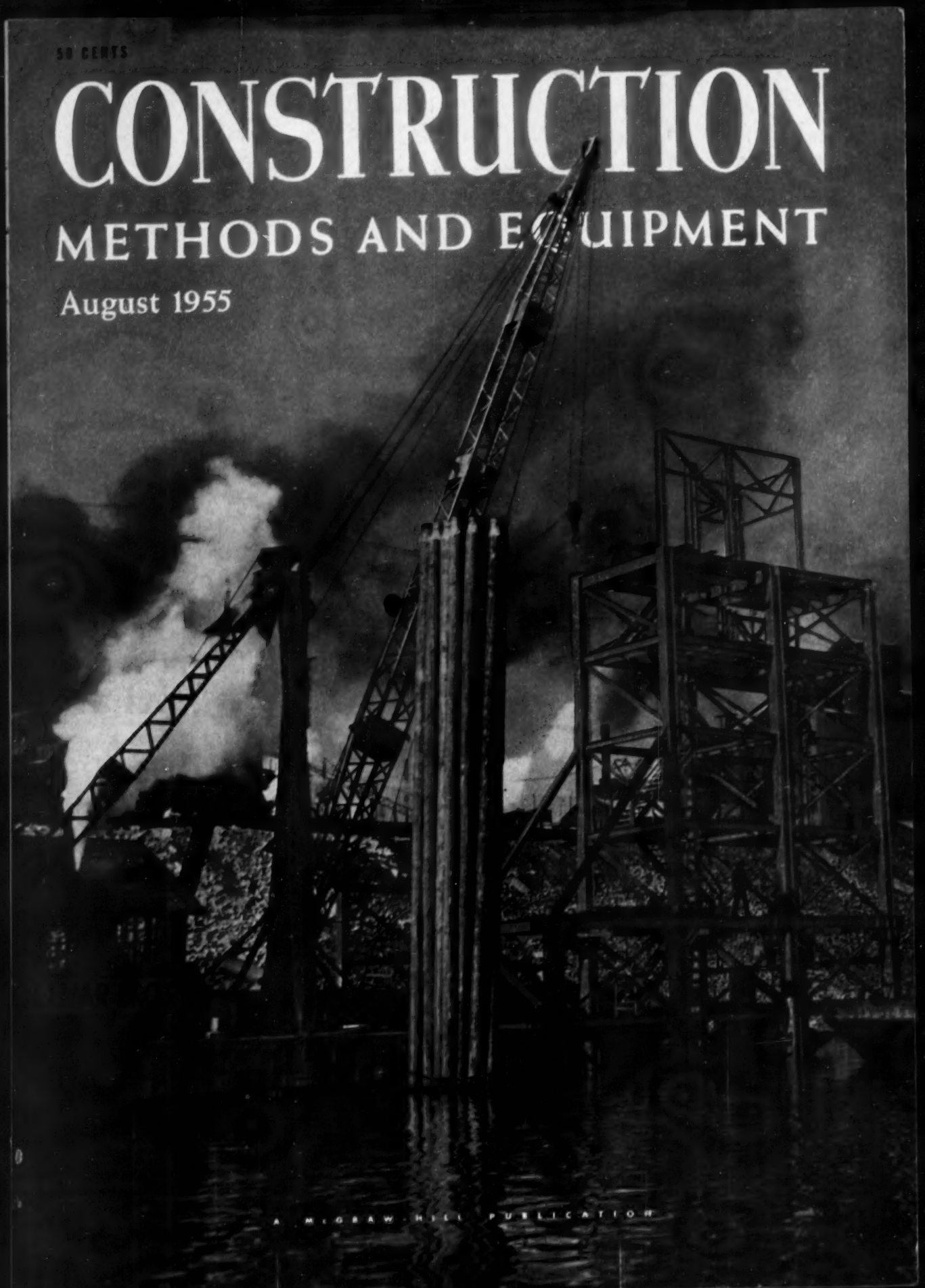
50 CENTS

CONSTRUCTION METHODS AND EQUIPMENT

August 1955



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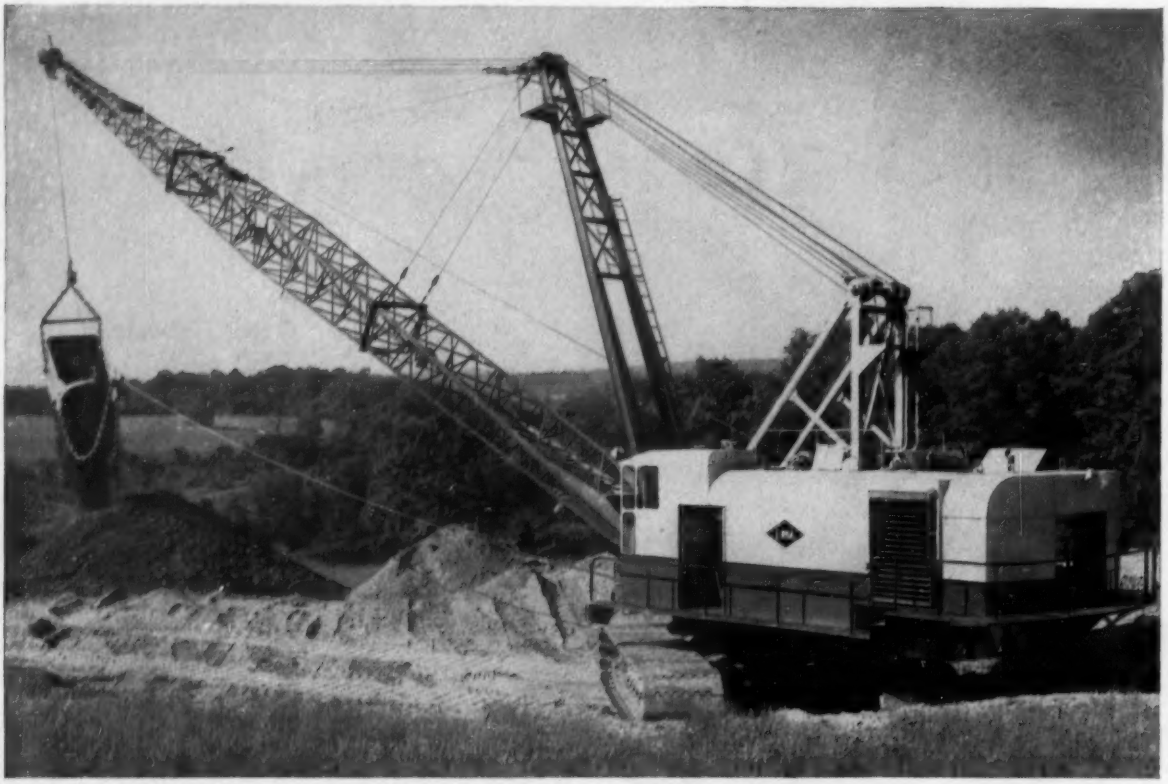

This Torcon-equipped dragline gets more work by the bucket with less work by the engine.

Self-contained oil circuit keeps TORCON efficiency high

This simple design feature is a big factor in keeping TORCON efficiency consistently high: the oil sump is an integral part of the housing—no complicated oil seals to lessen efficiency and complicate maintenance. Oil passages are cored in the housing—no extra hoses and fittings.

Easy accessibility is valuable, too. Simply remove two cover-plates, and the whole unit is fully exposed for inspection and service—no special tools needed.

The Clark-Torcon is a complete unit, mass-produced, available off-the-shelf to engine and original equipment manufacturers, and to owners and operators. It's the broadest line available to industry, with a wide range of wheel diameters and a complete choice of options, for easy fitting into any torque-transmission system.

There's a Torcon to FIT YOUR NEED

This fully illustrated, easy-to-read bulletin explains torque multiplication clearly; and indicates its many industrial applications. Use the coupon to get your copy.

A Complete Quality Line—Clark-Torcon

All Sizes—from 15 to 600 H.P.

Broad Range of Options—readily adaptable to many applications

No Cavitation—proper oil flow prevents turbulence and formation of air pockets to cause wear and loss of efficiency

High Efficiency over wide range—more work done, and reduced wear on components

Individually Cast One-Piece Elements—no welds or fabrications to distort under extreme loads

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CLARK EQUIPMENT COMPANY, Jackson 1, Michigan: Please send the CLARK-TORCON Bulletin

Name_____ Position_____

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B.F.Goodrich

All-Nylon tires recapped again and again, cut costs one-half, contractor reports

S. J. GROVES AND SONS CO., builds roads all over North and South America. Equipment used by this Minneapolis, Minn., contractor includes tractor graders and scrapers, oil and sprinkler trucks, low-boys and trailers, dump trucks and compactors.

To keep tire costs at a minimum, this company uses B. F. Goodrich *all-nylon* tires. On the Indiana Turnpike, the project engineer reports: an average life of over 4,000 hours, sometimes as many as 5 recaps. No wonder Groves finds B. F. Goodrich tires cut costs one-half!

Nylon can lower your tire costs, too

Nylon is stronger than ordinary cord materials. It withstands double the impact, resists heat blowouts and flex breaks. That's why the B. F. Goodrich *all-nylon* tire body outwears even its extra-thick tread, *can be recapped again and again!* You get more original hours of service, more hours of service per recap. You save money on tires!

B. F. Goodrich makes a complete line of *all-nylon* tires for every off-the-road job. See your B. F. Goodrich retailer today and find out how you can cut tire costs to a minimum. His address is listed under Tires in the Yellow Pages of your phone book. Or write *The B. F. Goodrich Co., Tire & Equipment Division, Akron 18, Ohio.*

THESE RECAPPED B. F. Goodrich *all-nylon* Rock Logger tires (rear) work 20 hours a day, 6 days a week the year 'round.

S. J. GROVES uses 7 kinds of B. F. Goodrich tires on the Indiana Turnpike project, including the Super Traction tires shown above.

Specify B. F. Goodrich tires when ordering new equipment

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

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NO NEED TO LOOK OR LISTEN WITH THE SUPER-FAST PROTO TORQUER

NEW Model F Torquers Meet Military Specs

Design variations from standard Torquers to meet U.S. Air Force Specifications are found in the New Model F Torquers. Capacities from 150 to 4800 in.-lbs., with ¼" to ¾" drives.

Just set the micrometer-type handle—the wrench releases *automatically* at the exact torque you want. No troublesome clicks, dials, scales or pointers. It's fast, accurate, rugged! 27 models, ranging from 5 to 4800 in.-lbs. and 5 to 500 ft.-lbs.—with plain or ratchet head. Buy them from your PROTO dealer *today!* Send 10¢ for catalog of entire line to

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Volume 37
Number 8

CONSTRUCTION METHODS AND EQUIPMENT

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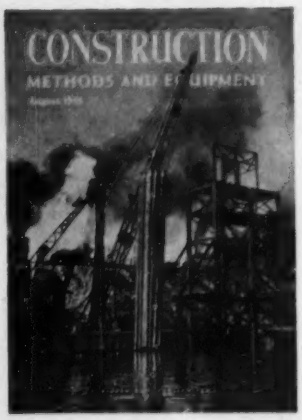

On the Cover . . .

A floating American derrick erects the head structure for a sulfur unloading dock in St. Louis. Behind the interesting construction scene (see article, p. 68) is a story of a revolutionary method of handling sulfur, one of America's most vital chemicals. Normally, sulfur is transported as a dry yellow powder. But a combine of companies has now developed a method of liquefying the material at 300 deg and transporting it in special vacuum-type barges. After a 1,100-mi trip up the Mississippi to the new dock, molten sulfur will be pumped out and stored in insulated tanks until needed. Each tank holds 4,600 tons.

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Pay Dirt in This Issue

August, 1955

How to Work With Blast Furnace Slag 54

Slag makes an excellent aggregate for macadam, concrete, or blacktop—but it takes a few tricks to handle it.

Drag 65-Ton Crane from Chicago River 60

Block and tackle lash-up, powered by varied land-based equipment, retrieves toppled rig without further damage.

Simple Form is Key to Fast Deck Paving 64

Good forming ideas, plus a unique application of a concrete set-retarding agent, establish a fast paving pace.

Motor Grader Specifications 74

Comparison chart lists all important features of current U. S. motor graders. Better file it for future reference.

Dirt Flies at Buford Dam 84

Contractor tells how he was able to move 4,500,000 cu yd of material in year's less time than originally planned.

The Importance of Pre-Bid Investigation 102

Facts are better than guesses. An expert tells what procedures to follow to insure most accuracy in preparing bids.

Single Paving Spread Lays Mile a Day 126

Hauling plant-mixed concrete in dump trucks, and finishing it with five machines, establishes new paving record.

Have Your Used Oil Tested 136

Two major oil firms provide information on advantages of testing used oil on the spot and by laboratory methods.

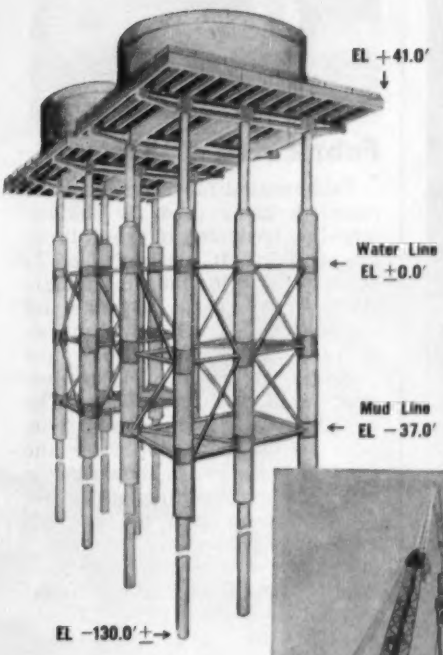
Job Talk 6
It's Your Business 22
Picture of the Month 40
Construction News in Pictures 43
Construction 'Round the World 48
Editorial 53
Spacer Strut Helps Bridge Job 62
Air Gun Greases Shovel Fast 67
Floating Rig Drives High Piles 68
Methods Memo 196
Systematic Tool Records 79
Precast Reservoir Roof 94
Sump Cushions Concrete Drop 99
Cooler Ups Hydraulic Output 115
Flute-Type Fasteners 119
"Give" Operator Own Machine 143
Contractor-Labor Relations 146
Sales and Service 153
Construction Equipment News 164

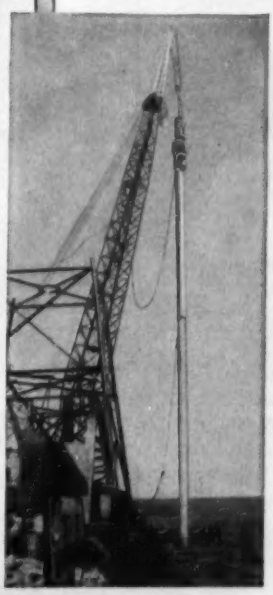
NEXT MONTH

Another of CM&E's authoritative series of articles on construction fundamentals begins in September. The series will cover modern methods of paving with bituminous material, concrete, and stabilized soil. The first: Surface Treatments.

Pioneering IN PILING PROGRESS

192-FT.-LONG PRECAST, PRESTRESSED CYLINDER PILE AND PRESTRESSED JACKET ASSEMBLY HIGHLIGHT TANK PLATFORM CONSTRUCTION IN GULF OF MEXICO





Owner: **MAGNOLIA PETROLEUM COMPANY**
Tank Battery Platform, 35 mi. offshore in Gulf of Mexico

Entire Platform Structure Designed by **RAYMOND CONCRETE PILE COMPANY**, New York

Components fabricated by **GULF PRESTRESSED CONCRETE PRODUCTS**, Morgan City, La.

General Contractor: **J. RAY MC DERMOTT, INC.**; Harvey, La.

● Few construction principles have presented a broader opportunity for engineers and constructors than has prestressed concrete. Example of pioneering in this field is Raymond Concrete Pile Company's prestressed hollow cylinder pile, used in lengths up to 192 ft., in a tank battery platform for Magnolia Petroleum Company, 35 miles offshore in the Gulf of Mexico.

Photo, at left, shows 36-in.-diameter cylinder pile, 192 ft. long, standing unsupported 172 ft. above mud, in which it had penetrated 20 ft. under its own weight.

Equally interesting is the precast, prestressed concrete assembly which serves as bracing jacket. The jacket structure, shown above, consists of 54-in. prestressed hollow cylinder piles, braced with concrete-coated pipe. Assembled on barges, the jacket assemblies, each weighing 230 tons, were floated to location, where lift was made and the barge moved out from under.

The prestressed 36-in. cylinder piles were also barged to the site, lifted by crane, lowered through the jacket piles, and driven to required resistance. Finally, prestressed deck slabs were placed in position, ready for installation of two 5,000-barrel tanks.

These piles are reinforced in the conventional manner, then centrifugally cast by spinning. Cylinders are spun in 16-ft. lengths, fitted together, and prestressed by post-tensioning cables run through horizontal openings left in the cylinder walls.

Special methods of joining the cylinders, post-tensioning the steel, and grouting the wire cables produce a homogeneous product of unusual strength and durability.

As is so often true in milestones of construction progress, Lone Star Cement was used, because quality attracts quality.

LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

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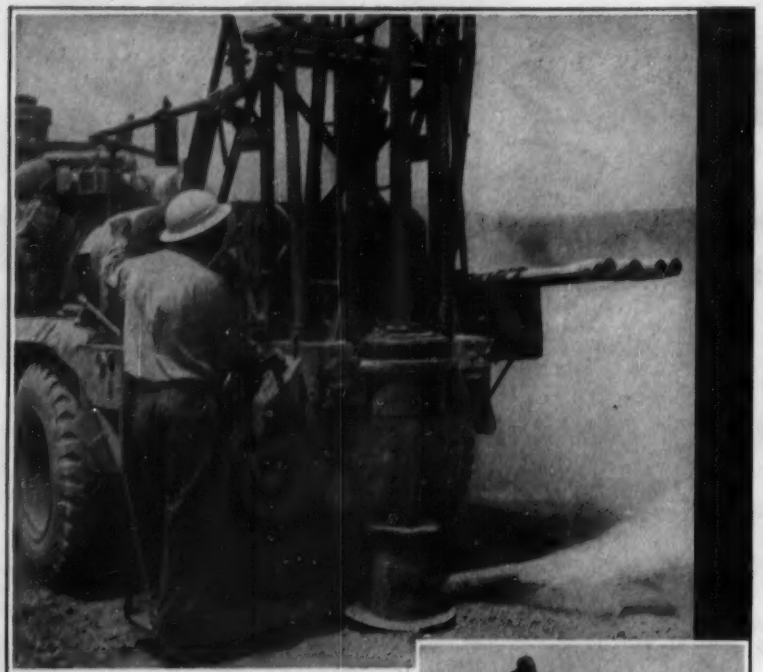
LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 18 MODERN MILLS, 141,600,000 SACKS ANNUAL CAPACITY



Davey Rotary Drill on James E. Hoffman job near Kerthaus, Pa.

cut drilling costs on every construction job!

DAVEY

Rotary Drills

On every big construction job, you can speed drilling . . . cut the costs of blast holes, structure testing, core drilling—with Daveys!

Davey Rotary Drills are suitable for mounting on any truck . . . move fast between jobs . . . are easy to set in drilling position. They are available in 6 different models—air blast, mud pump, or combination types. Rated capacities to 2,000 ft. Features include choice of power take-off or separate power unit operation, automatic hydraulic feed, hydraulic pull down, heavy-duty rotary table, rugged tubular box-type mast.

AA-1700

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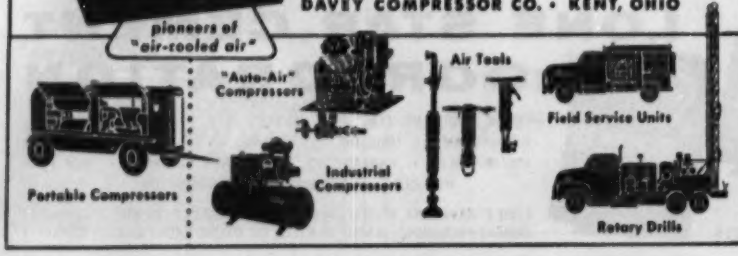


Job Talk...

. . . About Methods

Fabricated Rooter

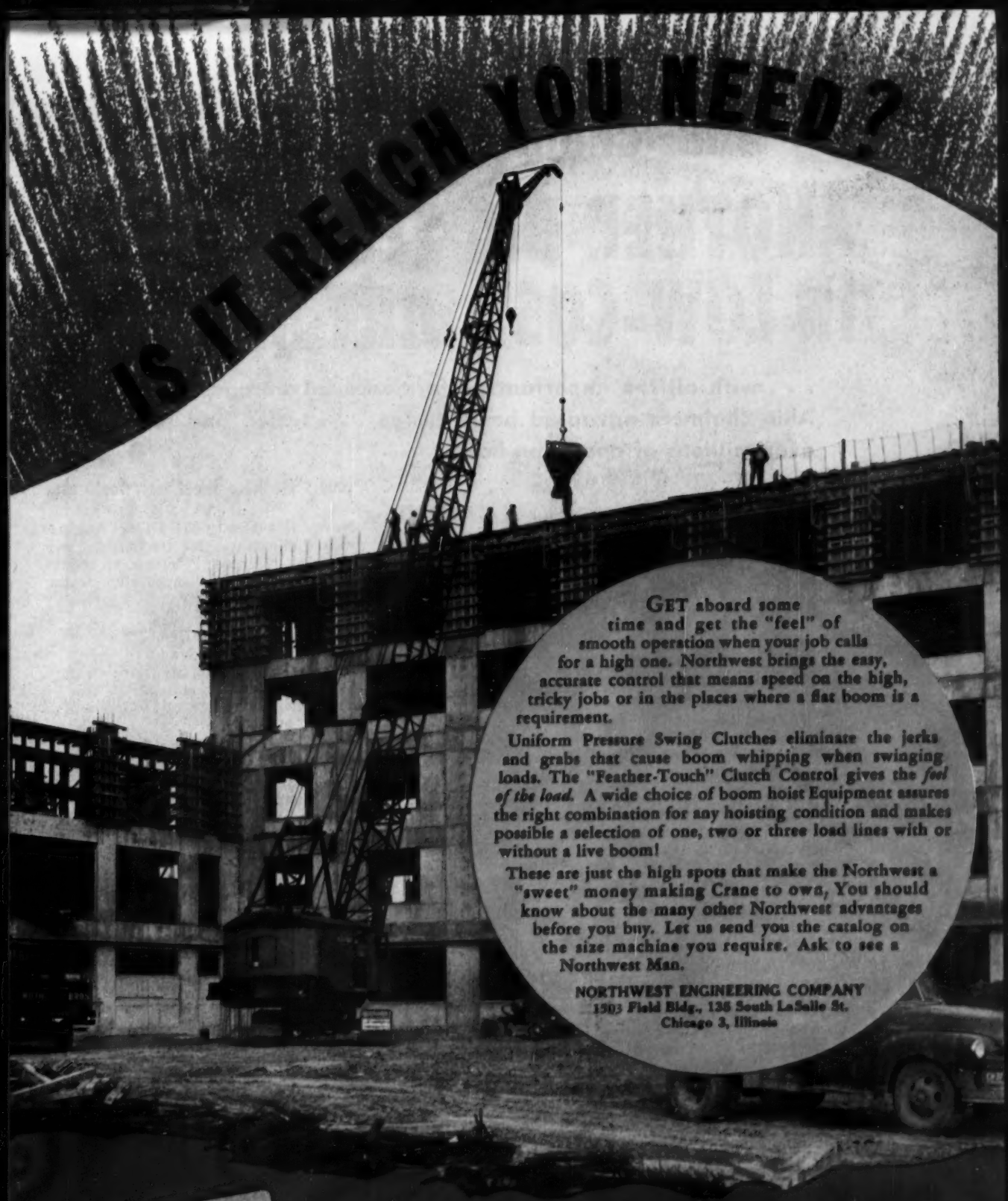
This unusual fabricated plow or rooter is being used for shallow pipe-line trenching in the California oil fields. It consists of an I-beam body with line pipe handle attached. It is easily portable and is pulled by a truck hoist with an A-frame attachment. The plow portion of the rig is made of plow steel welded to the body. The steering handle is made from 2-in. pipe. In use, one man rides the front of the plow, as shown in the photo, to supply digging weight. An additional man at the rear guides the plow.

Because of its size it is an ideal unit for small jobs around tanks and obstructions. (The Lincoln Electric Co.)

Mobile Light Tower

Self-contained, mobile light towers are solving the night illumination problem on a big earthmoving

(Continued on page 12)



GET aboard some time and get the "feel" of smooth operation when your job calls for a high one. Northwest brings the easy, accurate control that means speed on the high, tricky jobs or in the places where a flat boom is a requirement.

Uniform Pressure Swing Clutches eliminate the jerks and grabs that cause boom whipping when swinging loads. The "Feather-Touch" Clutch Control gives the *feel of the load.* A wide choice of boom hoist Equipment assures the right combination for any hoisting condition and makes possible a selection of one, two or three load lines with or without a live boom!

These are just the high spots that make the Northwest a "sweet" money making Crane to own, You should know about the many other Northwest advantages before you buy. Let us send you the catalog on the size machine you require. Ask to see a Northwest Man.

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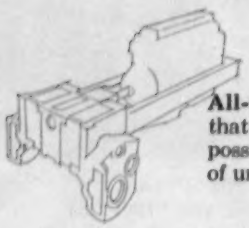
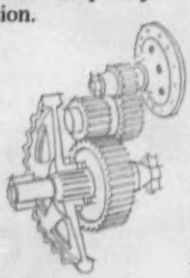
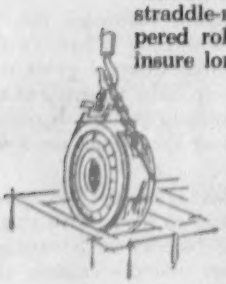
. . . with all the important performance advantages of Allis-Chalmers advanced basic design . . . tested and proved over millions of operating hours!



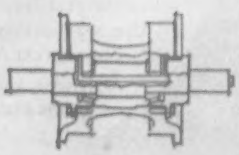
All-Steel Box-A Main Frame that soaks up shock loads, makes possible the service simplicity of unit construction.



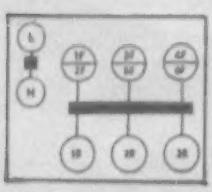
Exclusive One-Piece Steering Clutch and Final Drive Housing with all final drive gears straddle-mounted on tapered roller bearings to insure long life.



Unit Construction lets you remove engine, master clutch, transmission, steering clutches and final drives without disturbing adjacent parts.



1,000-Hour Lubrication Intervals for roller bearing truck wheels, idlers and support rollers . . . makes production time out of service time.



Dual-Range Constant-Mesh Transmission lets you go from any forward speed to any reverse speed by shifting only one lever. Eliminates double shifting! That means faster work cycles . . . more production!

plus . . . these great new features:

New Allis-Chalmers Diesel Engine with "follow-through" combustion and tornado turbulence . . . for smooth engine performance, cleaner combustion, extra long engine life.

New Wrap-Around Radiator Guard used as dozer lift frame to simplify design, reduce cost of bulldozer; guard tilts forward for easy service.

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Tough New Track — New design, through-hardened with extra toughness for long life even in severe abrasive conditions.

PLUS . . . new, all-weather cooling; independent radiator-core mounting; new strength and capacity in final drive gears, shafts and bearings.

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You owe it to yourself to investigate the performance advantages of the HD-11 . . . newest addition to the Allis-Chalmers leadership line. See your nearby Allis-Chalmers dealer now.

HD-11

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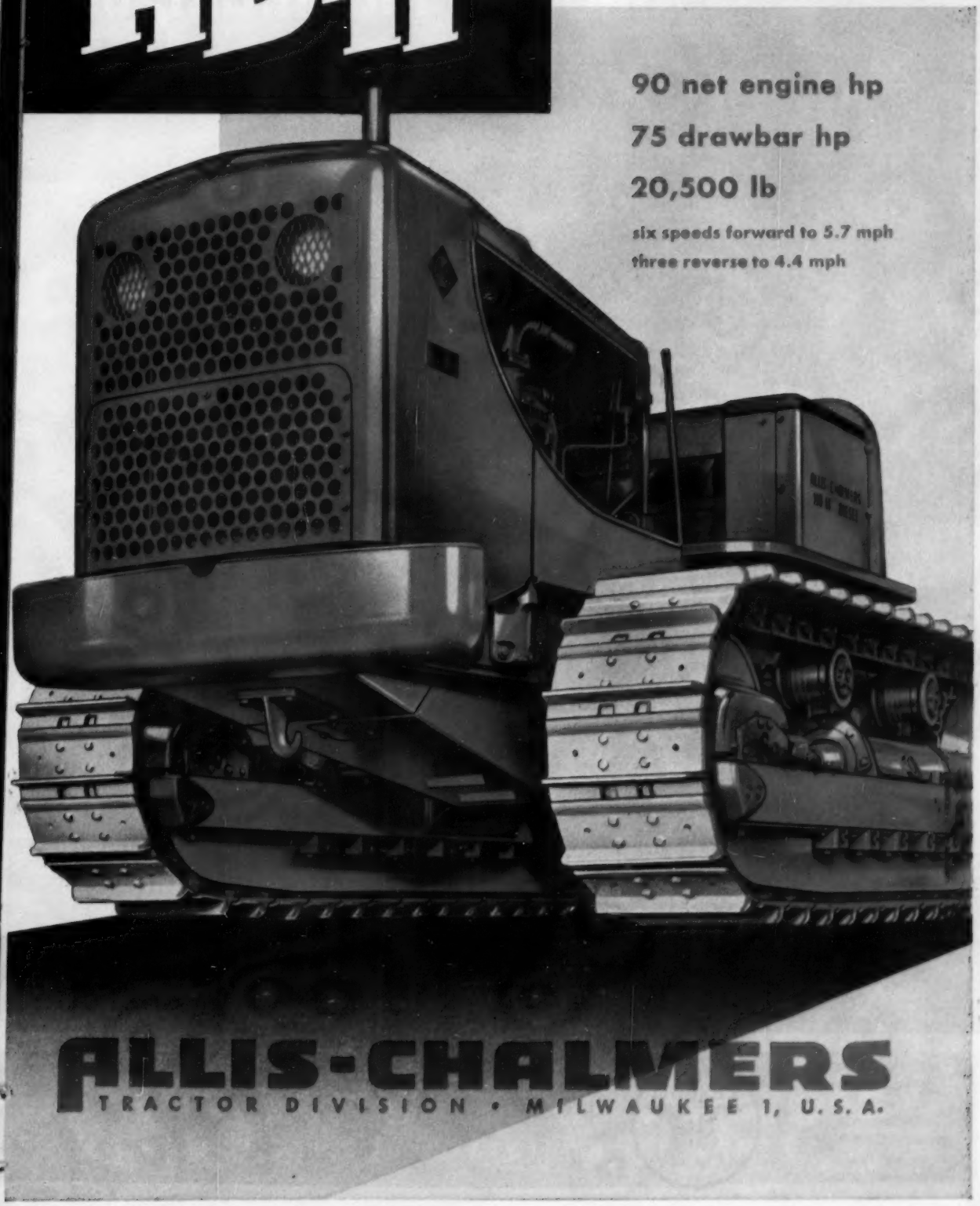
75 drawbar hp

20,500 lb

six speeds forward to 5.7 mph
three reverse to 4.4 mph



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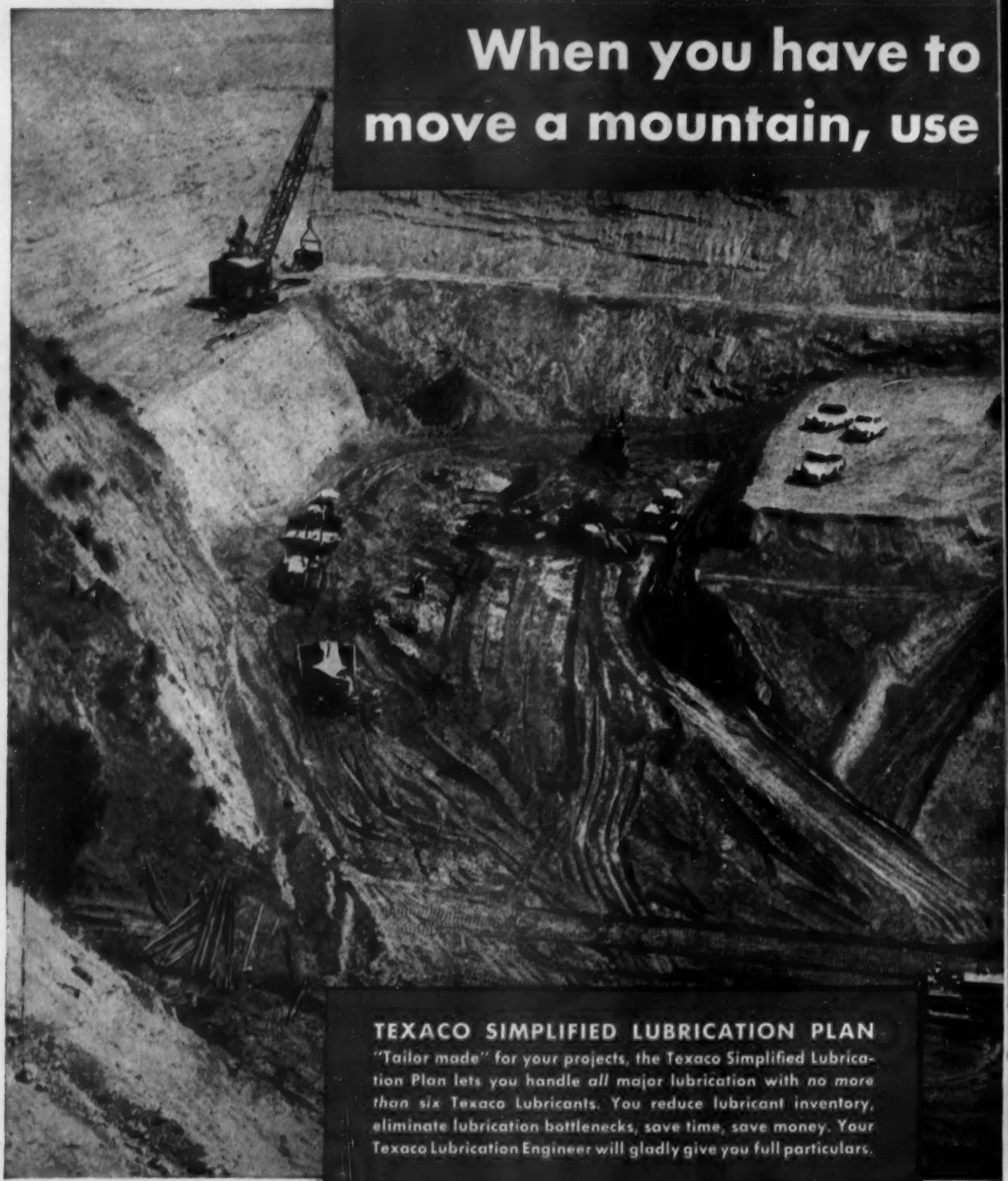

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In wheel bearings, *Texaco Marfak Heavy Duty* offers the same fine protection. It provides effective lubrication inside the bearing, but retains its original tough consistency at the outer edges — sealing out dirt and moisture, sealing itself in. This assures not only much longer lasting protection, but safer braking. No seasonal change is required.

NEW MULTI-PURPOSE MARFAK

Texaco Marfak Heavy Duty Special is the new, lithium-base, multi-purpose member of the famous Marfak family — especially designed for those who want *just one lubricant* to handle all chassis, wheel bearing, water pump and other lubrication. *Texaco Marfak Heavy Duty Special* pumps easily even at winter temperatures and lubricates effectively regardless of the thermometer. It resists water washing and stands up in the severest service.

MORE THAN 555 MILLION POUNDS OF TEXACO MARFAK HAVE BEEN SOLD

For transmissions and differentials, use *Texaco Universal Gear Lubricant.* It assures smoother, quieter meshing, extends gear life and reduces maintenance costs.

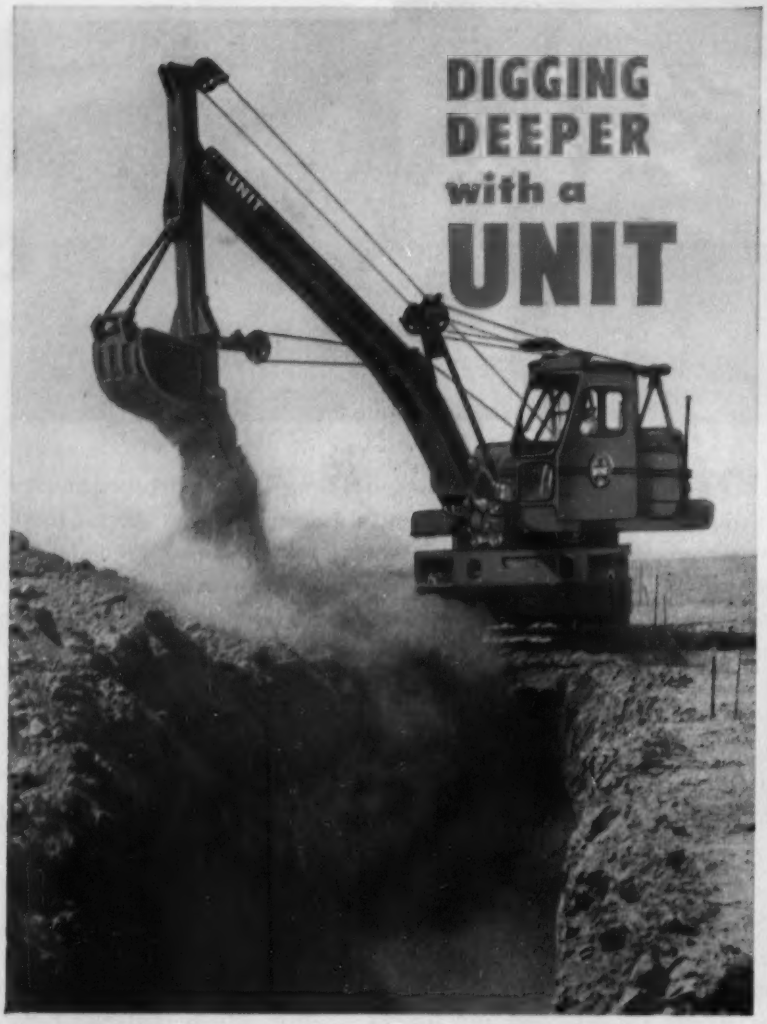
For crawler tracks, use *Texaco Track Roll Lubricant.* It acts to keep dust, mud and water away from the bearings, assuring their long life and trouble-free operation.

A Texaco Lubrication Engineer will gladly help you simplify your maintenance lubrication for greater efficiency and economy all around. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT



You'll Dig More Jobs At More Profit With A UNIT TRENCHOE!

Accurate deep digging of trenches for pipelines, sewers, water connections, footings, basements and culverts is easily and quickly accomplished with a UNIT Trenchoe. The "Goose-neck" boom with its long deep reach assures maximum production. Also saves time trimming vertical sidewalls and corners, and in leveling floor surfaces. Powerful... Compact... Perfectly Balanced. Every UNIT is designed to meet the most rigid demands. Investigate today and earn more pay.

UNIT models are available in ½ or ¾ yard Excavators . . . Cranes up to 20 tons capacity . . . Crawler or Mobile types . . . Gasoline or Diesel. Ask for literature.

UNIT CRANE & SHOVEL CORPORATION
6305 W. Burnham St. • Milwaukee 14, Wis., U. S. A.

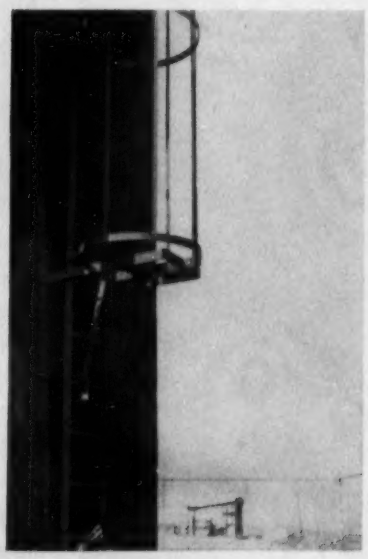
Geared to Produce Maximum Yardage

JOB TALK . . . Continued from p. 6

job at Stewart Air Force Base, N. Y. They carry 15 lamps, generate their own electricity, and are quickly moved to new locations.

Union Building and Construction Co., Passaic, N. J., made the simple units right on the site when conventional towers proved slow and awkward to move about. The contractor needed a highly mobile tower that could operate by itself. So, he mounted a Kohler 5-kw generator set on one end of a farm wagon and a fuel drum on the other. Between them, he erected a job-welded telescopic tower consisting of two 2-in. angle frames guyed to the wagon. The top frame rides in the bottom. A hand hoist adjusts tower height from 10 to 20 ft.

Ralph Moore is equipment superintendent on the job for the contractor.



Guard Device

The problem of keeping trespassers off the ladder of an oil storage tank was solved by this locked barrier. The unit anchors to the hoop at the rear and locks to one of the lower stair bars by means of a short length of angle iron pivoted to the unit. It is constructed of lightweight strap iron. (The Lincoln Electric Co.)

Mobile Compressor Mount

Buckman Mines, doing cinnabar ore work on faults along a general shear zone 3 mi in length near Cloverdale, Calif., has adapted this mobile mount for an Atlas Copco

(Continued on page 20)

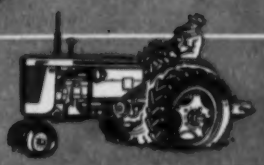
the UP and UP story on the AMERICAN BOSCH PSB!

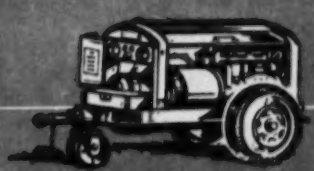
The introduction of the American Bosch "PSB" single-plunger distributor type fuel injection pump several years ago helped make smaller, lower-cost Diesels possible—and practical—for farm tractors, compressors, generating equipment, boats and trucks. Today, there are many thousands of PSB equipped Diesels in use, and their number is increasing at a rapid pace.

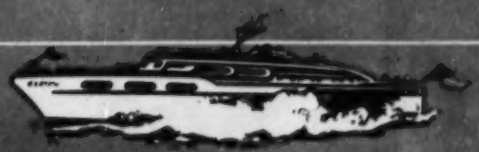
These simplified, compact pumps have an outstanding record for performance and dependability—assure users of long trouble-free service and low maintenance expense. No wonder production of American Bosch PSB pumps goes UP and UP month after month to meet the demand. American Bosch, Springfield 7, Massachusetts.

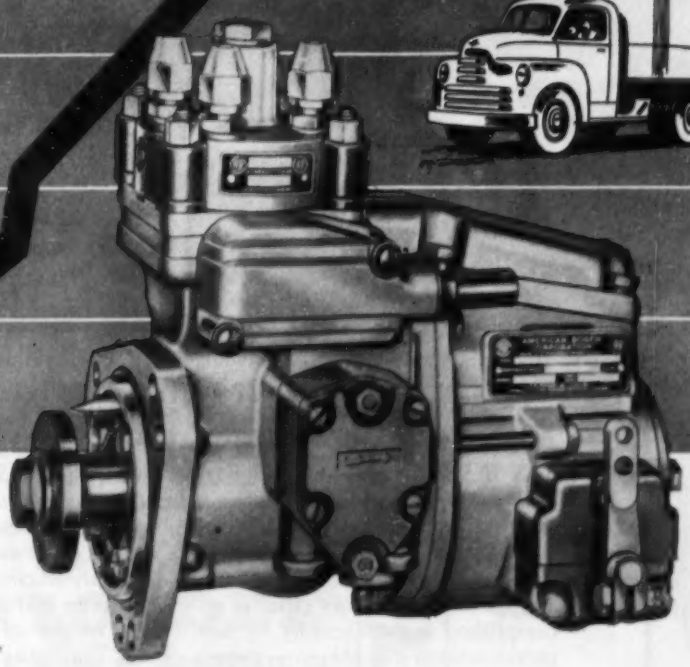
AMERICAN BOSCH

Division of
American Bosch Arma Corporation

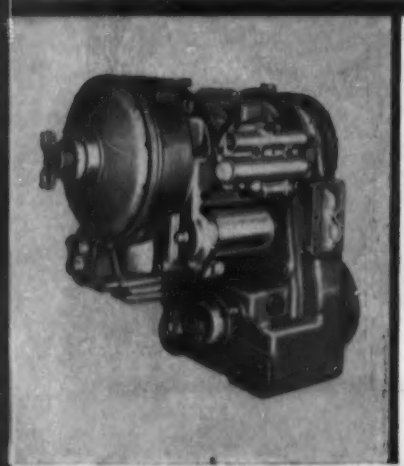








ANOTHER COMPLETELY NEW
PAYLOADER®
Biggest Yardage Producer In Its Class



COMPLETE Power-Shift Transmission

Makes ALL Shifts WITHOUT Stopping!

This "PAYLOADER" has a newly-developed power-shift transmission which is the easiest-operating, fastest-acting, most efficient ever put into a tractor-shovel. Shifting from *any* speed range to *any* other is accomplished instantaneously by fingertip action — *on the go* — there's no stopping, no "clutching". Directional shift (forward and reverse) is just as easy and just as fast. All speed ranges are provided in reverse as well as forward. Also included is a highly-efficient polyphase torque-converter that matches engine speed and torque to the load *instantly* and multiplies the engine torque up to 350%.

• with more digging power
• with faster operating cycles
• with easier, safer operation

YOU'VE never seen anything like this big new "PAYLOADER" — because there *is* nothing else like it. Nothing else like it in design — nothing like it in performance.

No other tractor-shovel gives you the tremendous digging power; the ability to get and keep heaped bucket loads under all conditions; the *complete* power-shift transmission which speeds operating cycles; the balance and stability to handle big loads fast, safe and easy.

If you want big, steady output — dependable performance hour after hour, put this husky HO on your jobs and you'll see the difference. Stop in at your nearest "PAYLOADER" Distributor and look it over.

HOUGH-DESIGN HOUGH-QUALITY

Safety and Stability. Special boom-arm shape and positioning keeps moving members out of operator's reach at all positions. Close, low, load-carry position and longer wheelbase provide stability and balance for fast maneuvering — with safety.

More Horsepower per bucket capacity than other standard models. Either gasoline or diesel power available.

Easy to Operate. Fullest operator visibility for safe, fast maneuvering; power steering; power-shift — no "clutching"; 4-wheel hydraulic brakes — vacuum boosted; foam rubber molded seat and back cushions; seat adjustable for operator comfort; longer wheelbase adds to rider comfort.

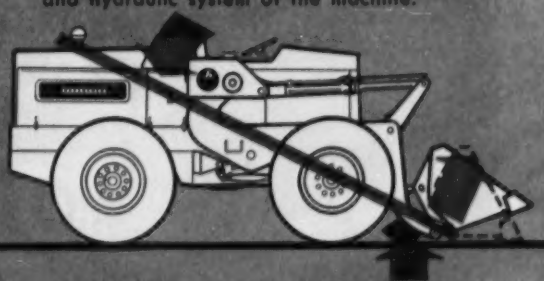
Superior Hydraulic System. Sealed, pressure-controlled hydraulic system to keep dirt and air out of oil; double-acting, long-life hydraulic rams with chrome-plated piston rods, and highest quality oil lines and fittings.

Fully-Equipped. Standard equipment includes: built-in headlights, back-up lights and tail lights; 12 volt electrical system for gas-powered units.

Extra Equipment for Greater Usefulness. Bulldozer blade, special buckets, bucket teeth, crane hook and lift fork attachments; snow plows, backhoes and many other useful and special accessories will be available.

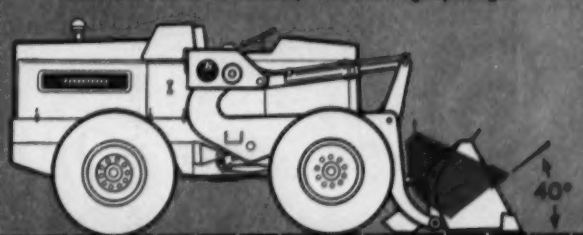
POWERFUL PRY-OUT ACTION

Tremendous pry-out force is obtained by using the breakout pads on the ground as a fulcrum for leverage. The load forces opposing the pry-out action are thus transferred to the ground through the pads instead of to the axle, wheels and hydraulic system of the machine.



40° BREAK-OUT AT GROUND LEVEL

You can get HEAPED BUCKET LOADS and you get them FASTER and EASIER WITH THIS NEW BUCKET ACTION. Most important of all — you KEEP BIGGER PAYLOADS — because the bucket can be tipped back a full 40 degrees at ground level before it is raised, eliminating spillage.



THE FRANK G. HOUGH CO.
704 Sunnyside Ave., Libertyville, Ill.

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

Send full information on the new Model HO, 2-cu. yd. "PAYLOADER"

NAME .....

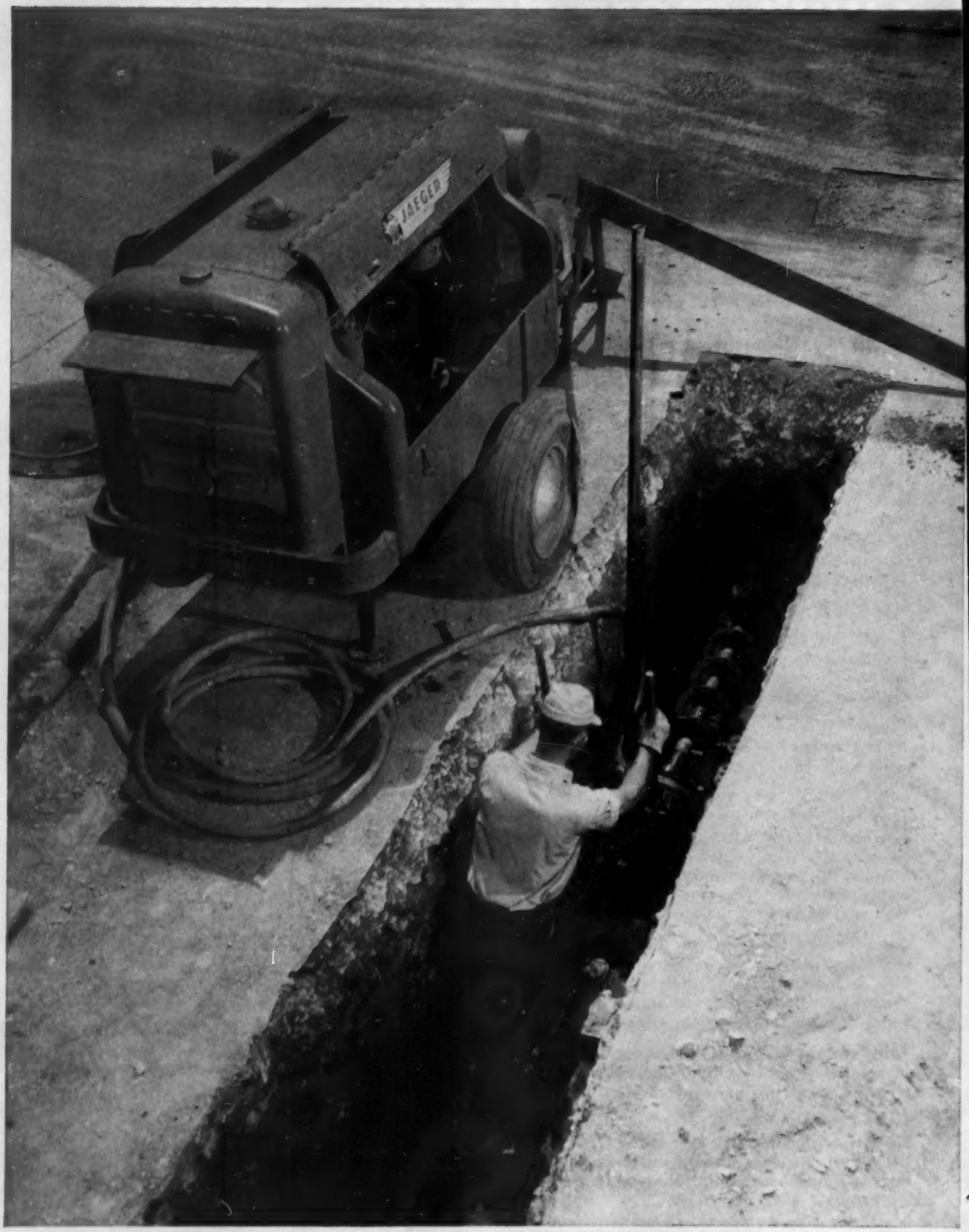
TITLE .....

COMPANY .....

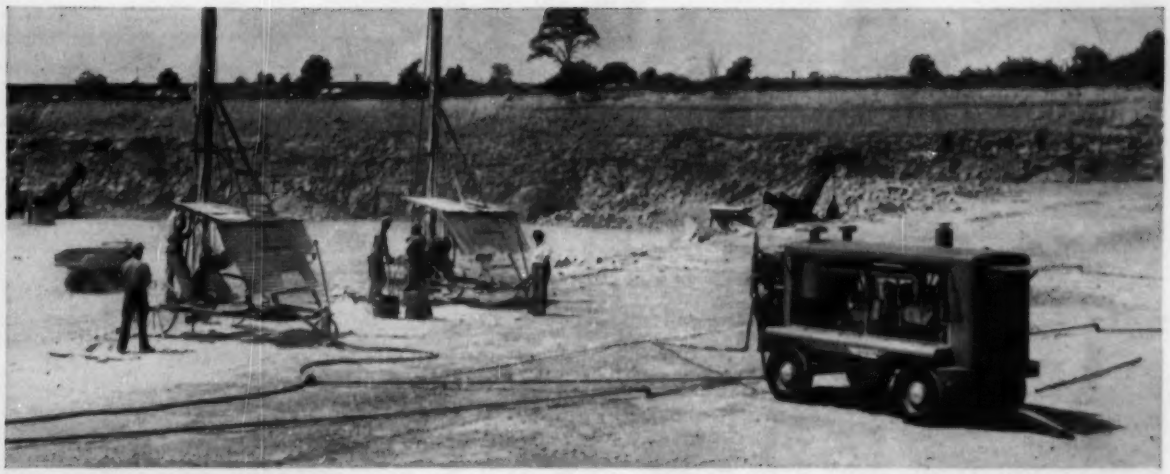
STREET .....

CITY .....

STATE .....



FULL SPEED AHEAD, AT AN EASY 1400 RPM: To provide the 110 cfm of 100 lb. air needed to run this 5 hp. Ka-Mo drill at top efficiency, the Jaeger "125" Roto never had to run faster than 1400 rpm. You save fuel, you save wear and tear on your engine and compressor because Jaeger high efficiency does the job at lower speed.



DRILLING UP TO 80′ PER HOUR IN HARD LIMESTONE, ON ONLY 7 GALLONS OF FUEL: These two quarry rigs, with 4″ drills and air tugger hoists, averaged 700′ to 800′ per 10-hour day drilling 19′ holes of 3″ final diameter in hard flux limestone. In more than 2000 hours of six-days-a-week operation, the Jaeger "600" Roto compressor averaged only 7 gallons of fuel per hour, because it never had to run faster than 1600 rpm.

Jaeger Roto air-plus

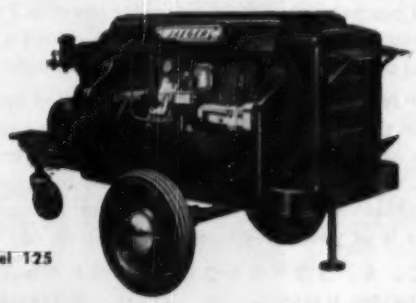
the first fully efficient rotary compressor has been proved on every kind of job

Since early 1954 Jaeger Roto compressors have logged thousands of hours on every kind of work from breaking pavement to operating heavy pile hammers.

In both the "125" and "600" models, two performance characteristics have been outstanding:

1. Higher efficiency, inherent in the Jaeger Roto design, enables these compressors to produce equal air volume at slower operating speeds than any other rotaries. As a result, they have the lowest fuel consumption and longest life of any rotary compressors on the market.

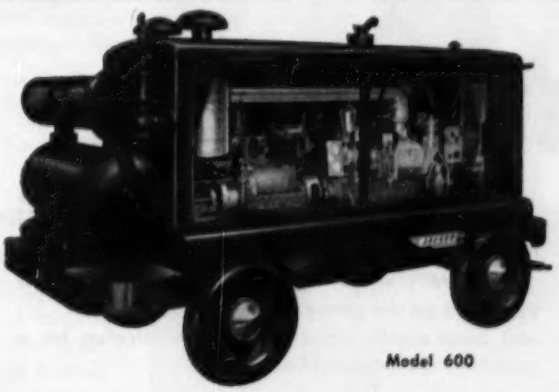
2. Air delivery is so instantaneous and so closely regulated to demand that 100 lbs. minimum pressure is maintained under all normal operation — *as smooth as steam.* Speed modulation is smooth and stepless over the entire operating range and so instant acting as to prevent any over-run and racing of engine. Controls are also simple, without complex linkage or toggles, or metering orifices.



Model 125

More efficient cooling, the elimination of cold weather "dry starts", closer control of engine water temperature, 8-hour fuel tanks and many other valuable Jaeger advantages are also offered in both the "125" and "600" cfm models of the Roto Air-Plus compressor.

For complete information, see your Jaeger distributor or send for Catalog JCR-5. For air users who still prefer the piston type, Jaeger Air Plus reciprocating compressors continue to be available in the Jaeger "new standard" ratings with the exception of the "600" size.



Model 600

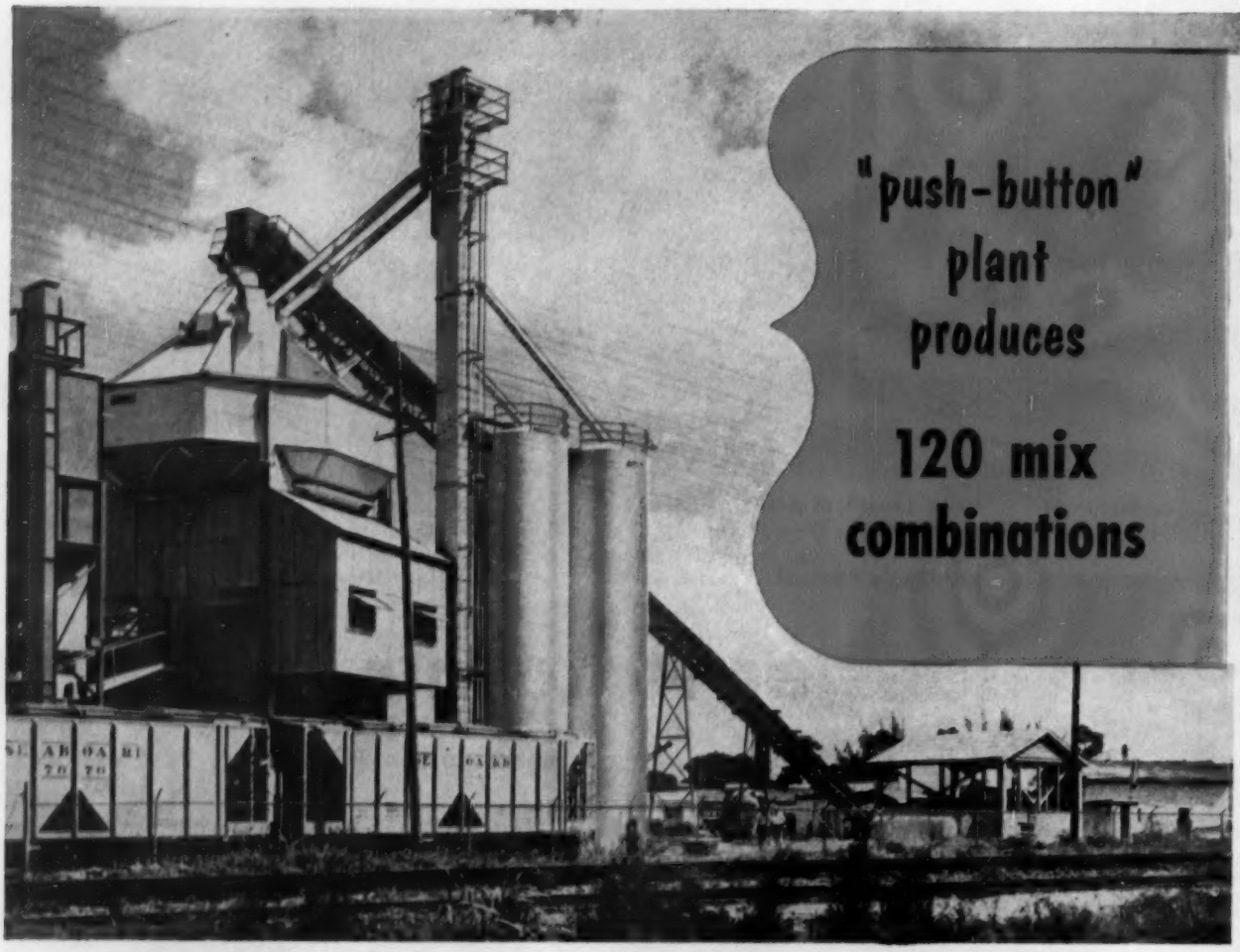
THE JAEGER

MACHINE COMPANY

800 Dublin Avenue, Columbus 16, Ohio

PUMPS • LOADERS • MIXERS

TRUCK MIXERS • PAVING MACHINES



"Repeater" automatically re-batches any mix selection

At the turn of a dial and push of a button, this Johnson commercial transit-mix plant produces any one of 120 different size and type batches of aggregates and cement. It weighs out any combination of materials you select on the central, dial-scale control panel . . . and automatically repeats any batch selection for a predetermined number of times.

The electric-control, 120-mix-selector panel provides for concrete of various strengths in any combination of materials, in ½ to 2 cubic yard batches. For each size batch there are individual selections for 3 to 6-inch slumps. Dial system makes it easy to change from one mix selection to another. To get any size or type of batch, operator merely turns the selector dial, sets the "repeater", pushes the "start" button . . . and the plant weighs out fast, with pin-point accuracy. During the batching cycle, a lock prevents accidental change of the mix selector.

Nine material weigh-dials on the control panel have individual pen-recorders. Exact weight of each batch is automatically graph-recorded. Johnson batching equipment consists of: six 5000-lb. aggregate batchers (two with automatic moisture-compensators) . . . a 3000-lb. cement batcher with dual fill valves for selecting 2 types of cement . . . 2000-lb. water weigh-batcher, and a 5-lb. (80-oz.) air entraining admix batcher. All fully automatic.

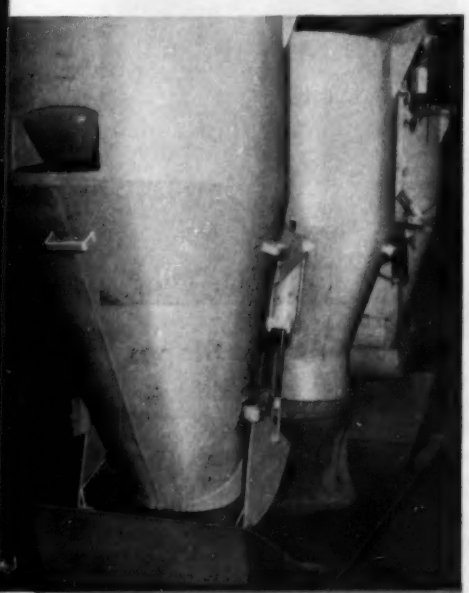
Similar Johnson equipment is also being used successfully on smaller, 24-mix-selector plants. Whenever you plan a new plant . . . or want to modernize an existing set-up, look into the increased efficiency you can get with Johnson equipment. You'll find your Johnson distributor is at your service, ready to help at any time.

C. S. JOHNSON COMPANY
CHAMPAIGN, ILLINOIS • *(Koehring Subsidiary)*

JOHNSON concrete PLANTS BINS • BATCHERS • HOPPERS SILOS • ELEVATORS • BUCKETS

Push-button control cabinet

with 9 material weigh-dials provides full-automatic operation for Johnson 120-mix-selector plant. In addition to selector and "repeater" controls, time and date stamp, and a consecutive batch-numbering stamp, it has a complete graphic recording system for all materials. As each batch is discharged, an individual pen-recorder automatically registers the "full" and "empty" weight on graph paper . . . makes sure that a complete batch is weighed out.



Single-material aggregate batchers discharge in 8 to 11 seconds. Automatic moisture-compensators give dry weight.

C1412

25-foot-per-minute Parsons 150 Trenchliner®

On drainage, irrigation and utility trenching, 150 wheel-type Trenchliner digs 16 to 26 inches wide, at depths to 5¾ feet. Hydraulic wheel-hoist maintains close grade tolerance. 30 digging feeds range from 12 inches to 25 feet per minute. Has square or round-bottom buckets; gumbo lips or "Tap-In" teeth; 16 or 12-inch crawlers; gas or diesel power. Tile box and chute optional. Parsons line includes 5 other models, all sizes and types.

PARSONS • Newton, Iowa
(Koehring Subsidiary)

Kwik-Mix Moto-Bug® has ¾-ton capacity

Moto-Bug power wheelbarrow hauls 10 cu. ft. (or 1500 lbs.) of any bulk materials. Has instant gravity-dump, with snub-line control. Climbs 20% ramps or grades. There's full power forward and reverse . . . and safe, automatic brake control. Hopper is interchangeable with 1500-lb. platform, or ½-ton (6-ft.) fork lift. For your heavier work, a larger size Moto-Bug is also available with big-capacity hopper, platform and fork lift.

KWIK-MIX • Milwaukee, Wis.
(Koehring Subsidiary)

Save turn-time with Koehring Dumptor®

Fast-shuttling Koehring Dumptor® eliminates slow turns at loader, on narrow haul roads, and at the dumping location. With constant-mesh transmission, Dumptor travels same speeds forward and reverse . . . gets its load, drives to fill, dumps and returns to loading unit without turning. Eliminating only 2 turns saves ½ minute on every cycle. Instant gravity dump cuts another 15 to 25 seconds off haul cycles with heavy-duty Dumptors.

KOEHRING Company
Milwaukee 16, Wis.

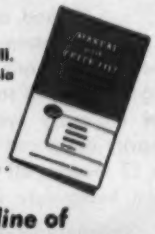
T66

for short cuts to faster concrete handling...

YOUR GAR-BRO dealer can help you select the best equipment to give you complete versatility for handling and placing concrete on *all* types and sizes of jobs. Anything from building construction to bridge and dam construction offers *short cuts to faster concrete handling.*

Your Gar-Bro dealer knows them all—he can make your concrete handling and placing jobs more profitable and he can prevent problems with high specification concrete. See him, consult with him about your next job.

GAR-BRO MANUFACTURING CO • Los Angeles, Calif. • Peoria, Ill.
General Offices: 2415 E. Washington Blvd., Los Angeles 21, California



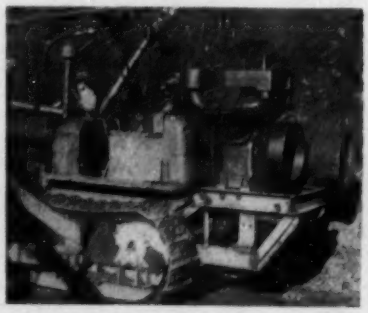
Ask your dealer for the Gar-Bro Manual . . .

GAR-BRO

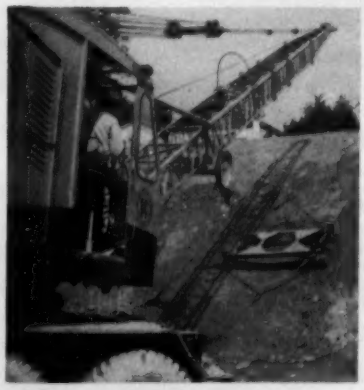
the world's most complete line of

CONCRETE HANDLING EQUIPMENT

JOB TALK . . . Continued from page 12



CT-4 compressor. Mounted on an Allis-Chalmers HD-7 tractor, it utilizes a standard power take-off arrangement. The compressor is rated at 185 cfm at 100 psi, operating at 970 rpm. This mobile arrangement handles two 2¾-in. rock drills and a pneumatic boom.



Frame Dresses Slopes

A job-made frame with a grader blade attached to both its upper and lower sides is doing a good job of redressing eroded slopes on the New York Thruway. The rig is pulled up and down like a dragline bucket to fill gullies, level bumps, and remove exposed boulders. For high mobility, John Arborio, Inc., Poughkeepsie, N. Y. contractor, operates the unit from a Koehring 304 truck-crane. It is particularly useful for keeping new slopes in shape.

W. E. Logan & Sons, Muskogee, Oklahoma

"4 years before overhaul with Cities Service lubricants!"

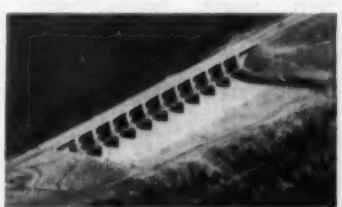
Builders of dams, airports, and a large percentage of the roads in Oklahoma, W. E. Logan & Sons use as many as 84 pieces of equipment on one job at one time.

Says Logan's Master Mechanic, Charlie Wills, "Often we have as many as four major road jobs going at once, and we average 240 hours a month on every piece of equipment we've got, year around."

Grueling work? You bet! And for the last 20 years Logan has relied on Cities Service to help get that work done. Here's the balance sheet: Using Cities Service C-300 Motor Oil, Trojan Greases, and Trojan MP-140 Gear Oil, Logan's D-8 Cats run four to five years before major overhaul. After four years, bearing inserts are worn less than .003 inches, liners less than .007 inches. In addition, Trojan MP-140 Gear Oil has kept gear cases so free of sludge that after five years, paint inside the cases is "perfectly clean."

That's only part of Logan's story. But it's mighty important—and it may become part of your story when you start using the Cities Service line of highest quality petroleum products. Learn the whole profitable story. Contact your nearest Cities Service representative or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

Machines, machines, and more machines! W. E. Logan & Sons uses as many as 84 pieces on a single job, all Cities Service fueled and lubricated. Many use Cities Service Hydraulic Oils, too.



The Tenkiller Ferry Dam Reservoir in Oklahoma was one of Logan's biggest jobs. An earthen dam, it required moving 10,809,580 yards of earth, took 3 years to complete.

And always close by—Cities Service. For the past 20 years, wherever there's been a piece of Logan equipment at work, Cities Service Lubricants have been at work too.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

It's Your Business . . .

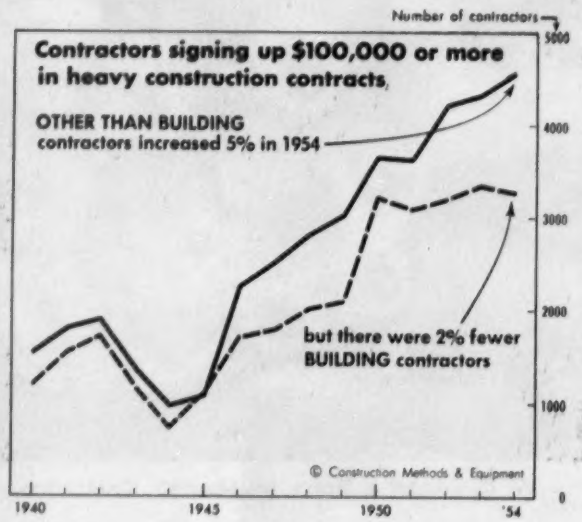
Big Contractors Lose Work to Smaller Ones

THE NUMBER OF CONTRACTORS signing up $1,000,000 or more in heavy construction contracts increased 3% in '54, but they took on 9% less contract volume than in '53. In contrast, smaller operators increased their total new contract volume. Contractors doing $500,000 to $1,000,000 numbered 5% more than in '53 and took on 4% more contracts while those doing $100,000 to $500,000 upped their volume 2% though there were only slightly more contractors of this size in '54.

The newest of CM&E's annual studies of contractor new business shows a record number of heavy construction contractors in each size group who were active in getting new work during 1954. There were 2,260 firms who took on $1,000,000 or more in new business; 1,536 doing $500,000 to $1,000,000; and 4,047 with $100,000 to $500,000.

The trend of big contractors losing business to smaller operators was particularly striking in other than building. Contractors doing $500,000 to $1,000,000 increased their total contract volume by 12% and firms doing $100,000 to $500,000 upped their volume by 5%. But million-dollar contractors suffered a 12% drop in total value of contract awards.

There were 4,550 heavy construction contractors who took on at least $100,000 in 1954 contracts for other than building. This is the largest number of such firms for any year on record. They handled



11,502 projects, 9% more than in '53, with a total cost of $4.3 billion, off 8% from '53.

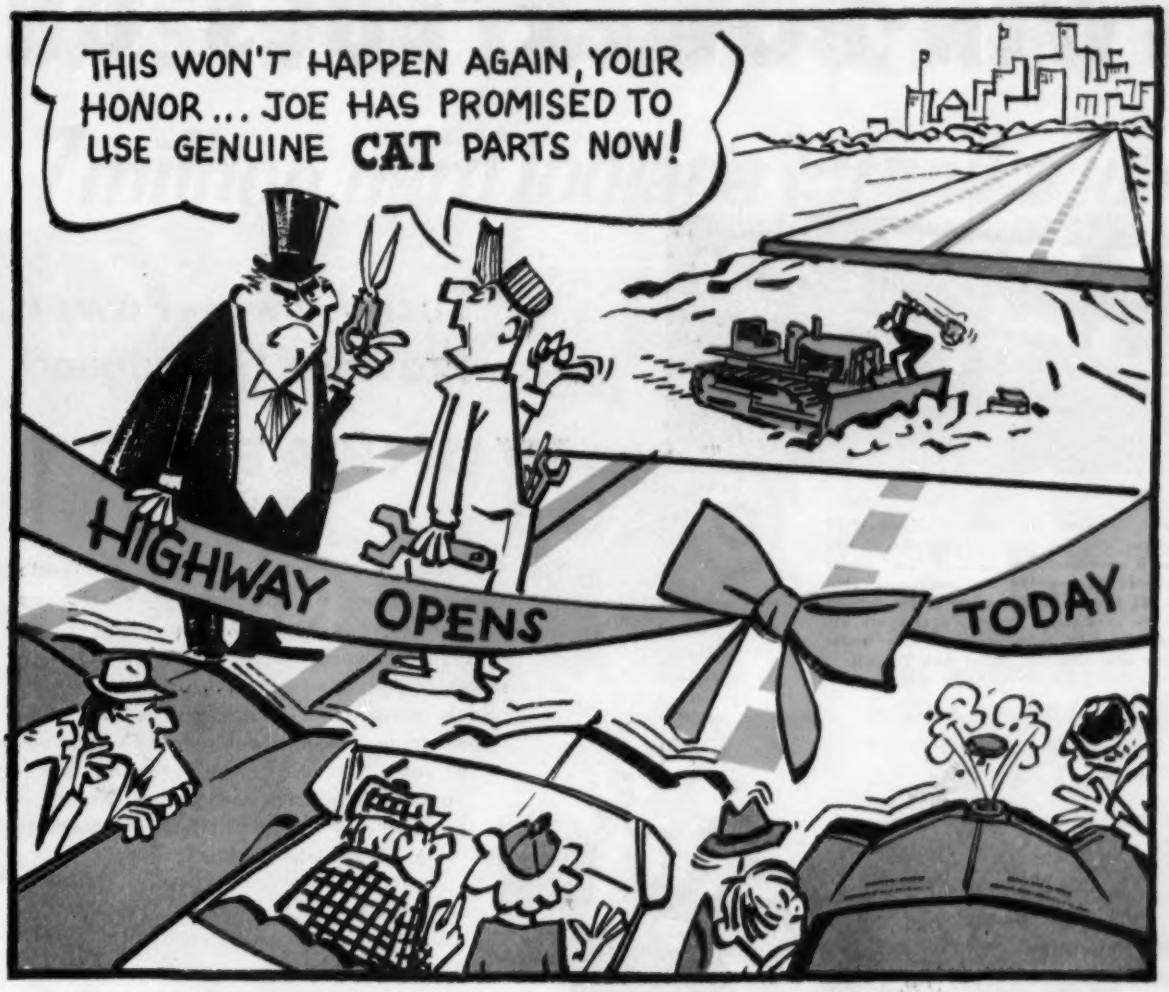
Highway Contractors Increase 10%

Close to half of all contractors doing $100,000 or more other than building business in '54, 2,243 signed up highway contracts. This is a 10% increase over 1953 and the largest number of contractors ever recorded by CM&E as signing up new highway business in a single year. These contractors took on a record high of more than $1.7 billion in highway contracts last year, 7% more than in '53. *(Continued on page 26)*

Contractor New Business in '54—By Size of Firm and Type of Work

As reported by CM&E

Total '54 Volume of all types	$1,000,000 or more			$500,000-$1,000,000			$100,000-$500,000		
Types of work	Contractors	Projects	Dollar volume (millions)	Contractors	Projects	Dollar volume (millions)	Contractors	Projects	Dollar volume (millions)
NONBUILDING									
Waterworks	211	420	$ 138	115	194	$ 34	357	472	$ 53
Sewerage	242	485	224	134	261	60	475	636	92
Bridges	284	447	344	140	226	53	257	357	51
Streets and roads	585	2,393	1,196	460	1,252	277	1,198	1,874	273
Earthwork, waterways	205	281	234	83	123	30	234	309	39
Airports	250	399	429	118	175	56	237	263	45
Unclassified	257	327	487	136	175	60	397	433	79
Federal (incl. above)	422	691	637	213	324	100	469	525	88
Total	1,064	4,752	3,052	840	2,406	570	2,646	4,344	632
BUILDING									
Industrial	480	910	1,721	162	234	66	493	572	100
Mass housing, commercial & public bldg.	1,061	2,488	3,001	625	812 25	403 10	952 52	975 49	330 12
Federal (incl. above)	116	100	133	30					
Total	1,196	3,398	4,722	686	1,046	469	1,401	1,547	430
TOTAL ALL HEAVY CONSTRUCTION	2,260	8,150	7,774	1,526	3,452	1,039	4,047	5,891	1,063



Down time can upset *any* schedule. Best way to avoid it is to insist on genuine CAT* parts every time. Then you're sure of getting parts that are made to the latest design, precisely manufactured of the right materials, rigidly inspected and tested.

Take track shoes, for example

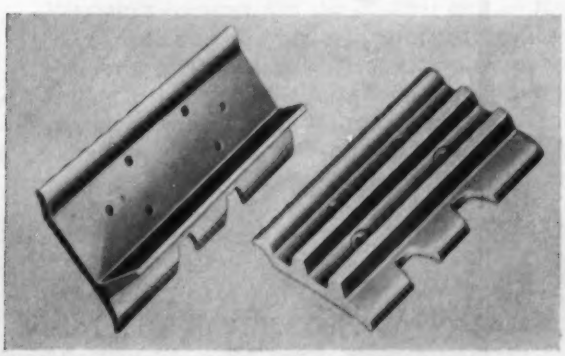
"If the shoe fits, put it on," can often be bad advice. Other makes of track shoes may *fit* all right, but how will they *wear?* It took years of research and field testing to develop Caterpillar's exclusive hardening process which makes genuine Cat shoes wear up to 75% longer than most others. The Cat shoes pictured here (a standard shoe, and a double grouser shoe for roughest rock conditions) are made of specially rolled high-quality steel sections—with a yield strength of 100,000 lbs. per square inch. With a substitute track shoe: who can be sure?

The difference on the job: with genuine Caterpillar-built track shoes you can count on longer work life, there's less replacement, and you get better performance under any working conditions.

With substitute parts: who can be sure?

Better get genuine Caterpillar parts every time.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.



CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

TWIN-POWER "EUCS" ON

Power to move the earth! A Euclid TS-18 Scraper with two engines and total of 494 h.p. is push loaded by a TC-12 "Euc" tractor powered by two 194 h.p. engines—a total of 882 h.p. at work. Because of the difficult sandy conditions, Western's scrapers are equipped with extra power for the tractor drive axle—300 h.p. rather than 194 h.p.

Euclid Twin-Power Provides Unequalled

WORKABILITY

Twin-Power—the use of two engines driving separate axles—was pioneered in the earth moving field by Euclid nearly 10 years ago. It provides larger capacity with power equal to or greater than single engine equipment . . . uses power and drive components that have proved their performance in other equipment on hundreds of jobs. Torque converters and semi-automatic transmissions assure easy operation and a smooth flow of power to meet all job conditions.

This TS-18 is one of Euclid's newest scraper models. It has a struck capacity of 18 cu. yds. . . . standard power is two 194 h.p. diesels with Torqmatic Drives. Western Contracting is using 10 of these "Euc" scrapers on the Indiana Turnpike.

*

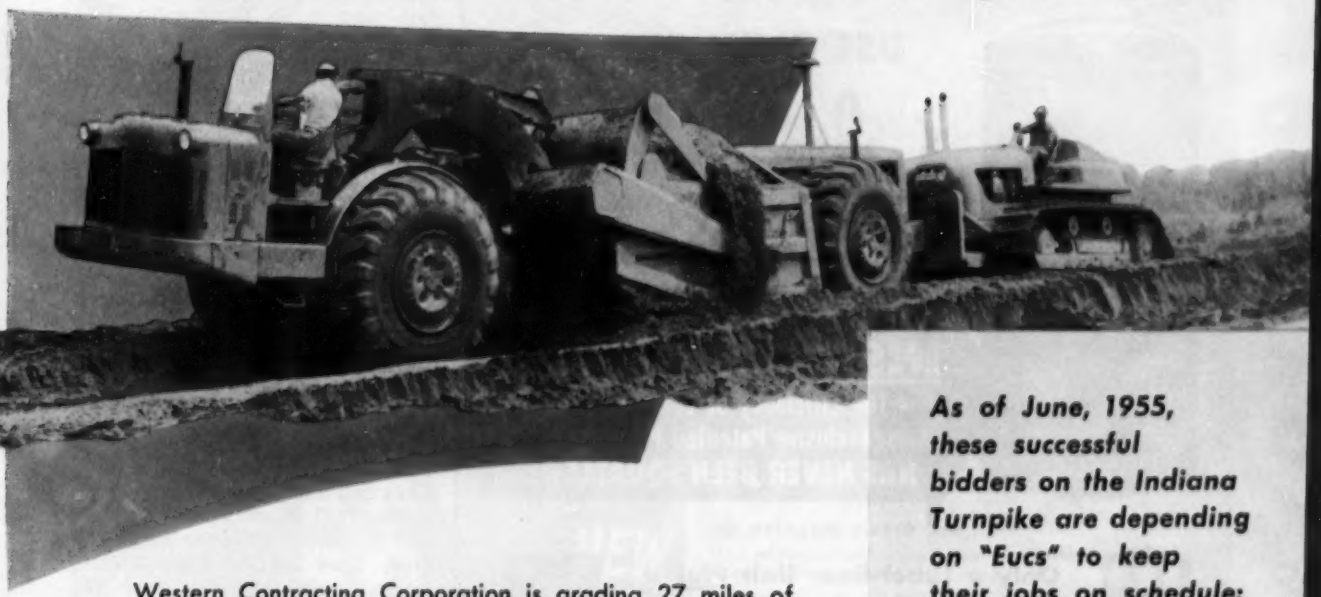
See Euclids complete line at General Motors POWERAMA - The World's Fair of Power - Soldier Field Chicago, Illinois, August 31 through September 25.

There's twin power in these 50-ton Rear-Dumps too! Six of these big units, first used by Western on Ft. Randall Dam, are working under an 8 yd. dragline. With a total of 600 h.p. this "Euc" has plenty of power and traction to move capacity loads through loose sand and tough hauls.

"Performance far above expectations" is the way personnel on Western's job describe the overhung engine Twin-Power Scraper push loaded by the new Euclid Twin Crawler.

WESTERN CONTRACTING'S

7 million yard Indiana Turnpike job!



Western Contracting Corporation is grading 27 miles of the new Indiana Turnpike east of Elkhart. About 7 million yards must be moved by November, 1956—work is currently on a two 10-hour shift basis six days a week. It's a big job—one that demands dependable equipment that can move big loads fast . . . the kind of job where Euclid Twin-Power performance really pays off.

On one section of their contract Western is using five TS-18 Euclid overhung Twin-Power Scrapers and 2 "Euc" TC-12 Twin Crawler tractors. Working in sand, the "Euc Twins" pick up loads of 15 bank yards or more and make round trips of a mile every 5 minutes, each averaging 180 bank yards production per hour. They travel at speeds up to 30 m.p.h. with full payloads and make the return trip over good haul roads with a top speed of 35 m.p.h.

Five other Euclid Twin-Power Scrapers and two additional TC-12 tractors are making the dirt fly on another section of Western's contract. On still another part of the job six 50-ton "Eucs" are hauling from an 8 yd. dragline. These Rear-Dumps, veterans of Ft. Randall Dam, are powered by two diesels having a total of 600 h.p. For complete information on the complete line of Euclid earth moving equipment or models suited for your jobs, call your Euclid dealer soon.

As of June, 1955, these successful bidders on the Indiana Turnpike are depending on "Eucs" to keep their jobs on schedule:

Arcole-Midwest Corp.
Chapin & Chapin
A. L. Dougherty
Peter Kiewit & Sons' Co.
D. R. Smalley & Sons
Suber & Co. and Ballenger Paving C
Union Building & Construction Cor
Western Contracting Corp.
Winston Bros.

• • •

Again "Eucs" outnumber all competitive rubber-tired equipment combined on a big turnpike project!

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

GM GENERAL MOTORS

THERE'S NO SUBSTITUTE FOR LUBER-FINER'S ENGINEERED PROTECTION!

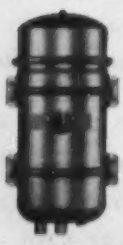
USE ONLY GENUINE

Luber-finer

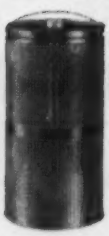
DIESELPAKS

YES! IT'S WHAT'S **INSIDE** THAT COUNTS!

The Efficiency of Luber-finer's Exclusive Patented Process HAS NEVER BEEN EQUALLED!



Only a Luber-finer Unit Plus a Genuine Luber-finer Pack can give the Exclusive Patented Filtering Process that has made Luber-finer The Standard Of The Industry Since 1936!!



THERE'S A LUBER-FINER MODEL FOR EVERY TYPE OF ENGINE...EVERY TYPE OF OIL!!

LUBER-FINER PACKS AVAILABLE

1. REFINING PACK—Introduced to the public in 1935 for use with straight mineral oils, fuel oils, hydraulic oils, and inhibited industrial oils.

2. DIESELPAK—First made available in 1941, the DIESELPAK was primarily designed for use with H.D. detergent compounded oils and has also achieved outstanding results when used with fuel oils and straight mineral oils.

DON'T BE MISLED BY PRICE ALONE!

There is NO substitute for DIESELPAK'S Patented Filtering Process for H.D. Compounded oils AT ANY PRICE!

The DIESELPAK cleans more oil faster—keeps it CLEAN longer—and gives more service and better engineered protection than *ANY* of the substitute filtering elements being offered for Luber-finer units.

IT PAYS TO GET THE BEST!

STANDARD OF THE INDUSTRY SINCE 1936

Luber-finer Units are Standard and Optional Equipment on America's Leading Diesel Trucks, Tractors, Stationary Engines

WRITE FOR COMPLETE INFORMATION TO DEPT. 20

LUBER-FINER, INC., 2514 S. Grand Ave., Los Angeles 7

IT'S YOUR BUSINESS . . .

Continued from page 22

The biggest increase in highway contractors was a 20% rise in those firms which did a total business in all types of construction of between $500,000 and $1,000,000 in contracts. This group of 460 contractors handled $277 million in highway awards, 19% more than in '53. There were 10% more firms in the $100,000 to $500,000 bracket doing highway work in '54. However, these 1,198 contractors had 11% less dollar volume of highway awards, $273 million, than in 1953, even though they had 9% more projects.

Million-dollar contractors continued to handle most of the highway volume with a total of nearly $1.2 billion in '54, 3% above 1953. There were 585 of these big contractors on highway work in '54, 4% more than in 1953.

More Waterworks Contractors

There were substantial increases in the number of contractors doing waterworks, earthwork and waterways and unclassified construction during 1954. Waterworks contractors increased 14% over '53 to 683 firms. They handled 1,086 waterworks projects, 11% more than '53, for a total volume of $225 million, 1% more than '53. In waterworks, the two larger size groups of contractors increased the most in number during '54. There were 25-26% more of these firms than in '53, and they both had 3% more dollar volume of waterworks contracts. In contrast, contractors in the $100,000-$500,000 bracket increased 5% and had 5% less new waterworks business.

While 14% more contractors handled earthwork and waterways construction in '54, contract volume was off 19% from '53. Only the smaller firms, $100,000 to $500,000, increased their business. They signed up 15% more contract volume than in '53.

Unclassified construction—mainly pipelines, tunnels, electric power and telephone lines — attracted more contractors of all sizes during '54 though total contract volume was off 22% from '53. There were 790 contractors doing this type of work last year, 12% more than in '53. They took on 935 projects with a total cost of $626 million.

Though dollar volume of unclassified was off, all of this drop was in business going to million-dollar firms which had a 28% slump in

(Continued on page 32)

NEW PROFIT BOOSTERS IN THE LORAIN 50

As you read about these newest profit-boosters, remember, they are important additions to the tried and proven features of 1-yard Lorain-50 crawler shovels and cranes . . . such as these leading design advantages: "never-die, can't stall" hydraulic coupling power take-off . . . Center Drive power distribution — power when and where you want it . . . sloping machinery frame that balances working weight for most effective "live counterweight" . . . finger-tip air power controls . . . anti-friction bearings . . . your choice of 4 crawlers—including the new long, wide "K-6" crawler beneath the new 25-ton crane.

Your next 1-yard shovel-crane is not up-to-date without these important Lorain design advances!

FEATURES FOR GREATER OPERATING EASE, INCREASED PRODUCTION, REDUCED MAINTENANCE

NEW — **OPERATING LEVERS AND LINKAGE . . .** Cuts operating effort in half. When optional air assist is added, even less effort is required.

NEW — **AIR OPERATED DIPPER TRIP . . .** Now air-controlled by convenient push-button on swing lever . . . almost effortless operation.

NEW — **IMPROVED HOIST DRUM DESIGN . . .** Now mounted on roller bearings, new clutch drum design for cooler operation.

NEW — **EASIER, FASTER HOIST CLUTCHES . . .** Now use pre-loaded springs on live ends, plus increased toggle action. Easier operation, less adjustment.

NEW — **IMPROVED CAB FOR OPERATOR COMFORT . . .** Weatherproof; improved vision; overhead window; roller-slide windows; comfortable seat.

NEW — **25-TON CAPACITY CRANE ON "K-6" CRAWLER**

NEW — **LONG, WIDE "K-6" CRAWLER . . .** 14-ft. long, 11-ft. 4-in. wide — 30 in. treads. Hardened roller path and teeth and driving rollers. Full air control of steering and tread lock.

NEW — **EASILY REMOVABLE COUNTERWEIGHT . . .** Counterweight is quickly removable for highway transportation. No load limit worries.

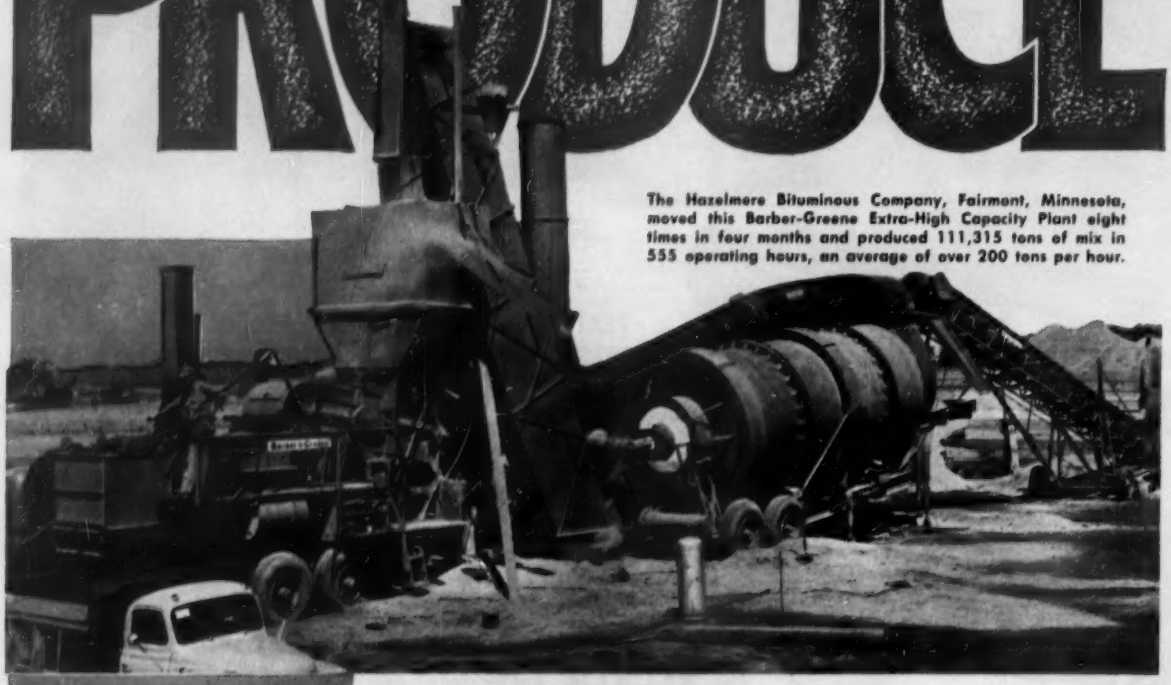
NEW — **TUBULAR CRANE BOOM . . .** Stronger, lighter, increases lifting capacities; permits longer booms; pin connected.

THE NEW LORAIN

THE THEW SHOVEL CO., LORAIN, OHIO

YOUR NEARBY THEW-LORAIN DISTRIBUTOR IS READY TO GIVE YOU FULL FACTS ON THE "50"

PRODUCE



The Hazelmore Bituminous Company, Fairmont, Minnesota, moved this Barber-Greene Extra-High Capacity Plant eight times in four months and produced 111,315 tons of mix in 555 operating hours, an average of over 200 tons per hour.

NEW Model 848 Heavy-Duty Mixer

NEW Model 838 Dryer

NEW Model 888 Dust Collector

NEW Model 888-B Gradation Unit

. . . form this new Extra-High Capacity Barber-Greene Bituminous Plant

PRODUCE more tonnage per hour for more profit per season.

PRODUCE mixes to meet all specifications.

PRODUCE continuously with the plant that is inherently automatic.

PRODUCE uniformly with interlocked proportioning.

PRODUCE on more jobs, at the job site with the plant that's truly portable.

55-8A-B

WRITE for INFORMATION

descriptive literature . . . sound movies

cost studies . . . nearby job inspection . . . plant layouts

Barber-Greene

AURORA, ILLINOIS, U.S.A.

BG

CONVEYORS LOADERS DITCHERS ASPHALT PAVING EQUIPMENT

PHOTO COURTESY WORTHINGTON CORPORATION, HARRISON, N.J.

Chrysler High-Speed Power and Fluid-Coupling protection ready this mixer for big season ahead

"Guestimates" differ as to how big a year lies ahead in building. But we do know that public projects, commercial and home construction will set records in practically every part of the country. And from that we can logically assume that transit mix truck operators will be among the busiest people in the nation.

By the same token, engines powering transit mixers must deliver top-performance on a scale never before approached. Wear and tear on engines, transmissions and equipment will be tremendous . . . "down time" will be avoided like the plague. Most manufacturers have wisely prepared equipment for sustained top performance. They have powered with power-proved Chrysler Industrial Engines and are ready for the big job ahead.

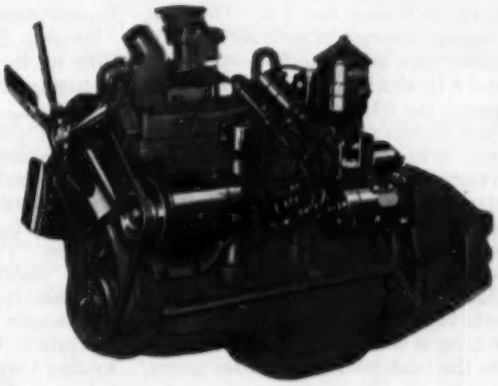
Pictured here is the Worthington Model LO 4½ Yd. Transit Mixer equipped with stationary hopper pouring footing for a commercial building in Ohio. While the compact Chrysler Ind. 30 Engine is placed immediately behind truck cab, drum rotation and drum speed may be controlled from either end of running board. This model is designed for fast charging and discharging.

Between the Chrysler Ind. 30, 230 cubic inch displacement engine, and the Worthington heavy-duty single lever operating transmission is a Chrysler gýrol Fluid Coupling. In this way Worthington protects driving and driven members from wear and tear imposed by shock loads, adds materially to clutch and transmission life.

When lightweight, high-speed, high-output power in a small, compact engine is indicated, check the Chrysler Industrial Engine Line, 230 to 413 cubic inch displacement. And remember, Chrysler Industrial Engines are not expensive. Production-line methods adapted to specialized industrial engine building provide custom-built engines at mass-production prices.

See a Chrysler Industrial Engine Dealer or write:
Dept. 108, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.

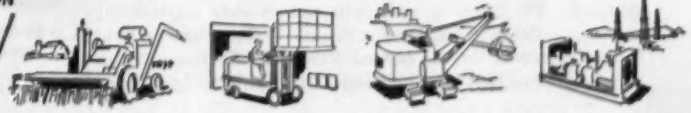
CHRYSLER INDUSTRIAL 30 ENGINE
—230 CUBIC INCH DISPLACEMENT



CHRYSLER ***Industrial Engines***

INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

HORSEPOWER WITH A PEDIGREE



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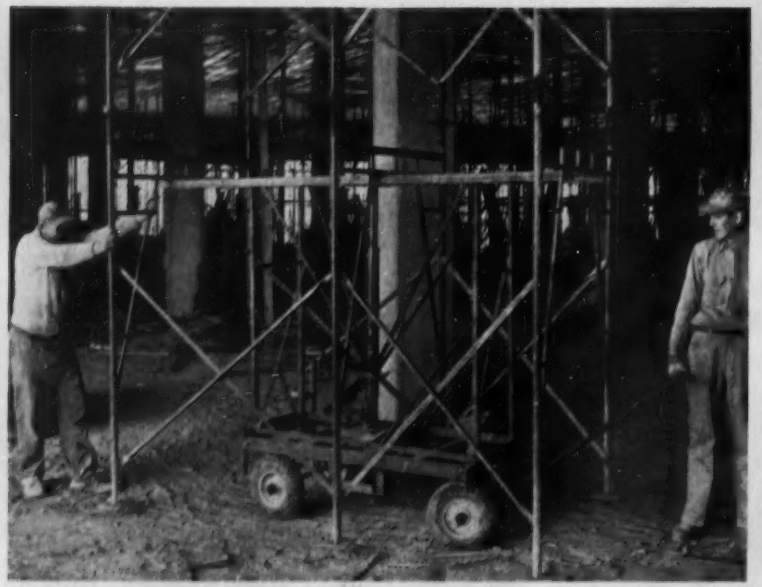
(Advertisement)



HORIZONTAL movement of three, two-frame high section of "Trouble Saver" Shoring to new pour area on the same floor is done with dolly equipped with pneumatic wheels and hydraulic jack. PS Co. supplied 4,730 5"-wide, 6'6" high frames for this multi-level shoring job.

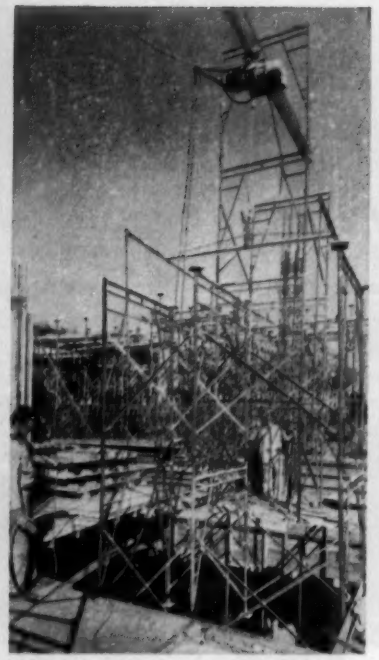
Sections of Steel Shoring Rolled, Lifted to Next Pour

IN ANAHEIM, CALIF., general contractor Ford J. Twaits Co. cut job time as much as 25 percent on the three-story, 330 ft. x 216 ft. Broadway-Hale department store by moving completely assembled sections of "Trouble Saver" Sectional Steel Shoring both horizontally and vertically. Here's how it was done:

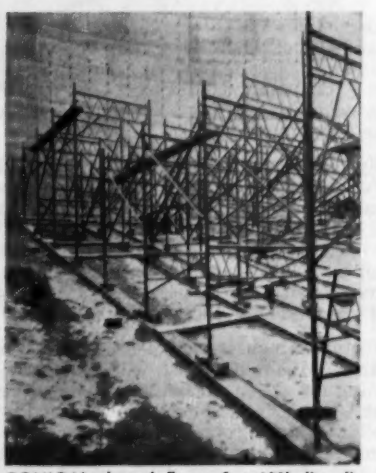
(1) The 5 ft. wide "Trouble Saver" end frames and diagonal crossbraces, supplied by PS Co., were assembled on the ground floor of the building. Maximum spacing between frames was 5 ft. The load bearing strength of each section was more than adequate for supporting the 8 in.-thick floor slabs. (2) After pours, the 30 sq. ft. shoring sections were transported horizontally to new pour areas on dollies equipped with 14 in. pneumatic wheels and a hydraulic jack. (3) When the next story was ready, the shoring sections were wheeled to escalator shafts or stairwells and raised to the next floor by a monorail-mounted electric hoist. The sections were again set on a second dolly and wheeled to the next pour area. After pours, the shoring sections were lowered from the forms by means of 20 in. extension legs.

The fact that "Trouble Saver" Sectional Steel Shoring could be moved with a minimum disassembly and assembly permitted unusually big pours of 550 to 660 cu. yd. at rates up to 93 cu. yd. per hour.

Across the country at the Jersey City Sewage Treatment Works, Jersey City, N. J., Garden State Constructors and Associates showed further proof of the versatility of "Trouble Saver" Sectional Steel Shoring by using it to shore a 32 ft.-high x 12 in.-thick roof slab from a difficult, cone-shaped floor. The unusual floor condition was overcome by using end frames of various heights and doing the final, close leveling with the 20 in. adjustable legs atop frames. Detailed information on "Trouble Saver" Sectional Steel Shoring and other modern steel shoring methods can be found in Bulletin PSS-33, available at no obligation from The Patent Scaffolding Co., Inc.



VERTICAL movement of same 30 sq. ft. "Trouble Saver" Shoring sections from floor to floor is accomplished with an electric hoist mounted on a monorail. Shoring sections are raised through escalator shafts and stairwells and released to a second dolly working that level. As shown, other "Trouble Saver" frames were used to support monorail.



CONICAL shaped floor of a 100' dia. digestion tank from which a 32'-high x 12"-thick concrete roof slab must be shored serves as base for "Trouble Saver" Sectional Steel Shoring. The floor dips to 12'6" below the bottom of the wall at the center. 2', 3', 4', 5' and 6'6"-high frames were used with standard braces for 5' spacing to provide level shoring. Rows of frames were placed 2'6" apart on braced wood sills. Garden State Constructors and Associates, general contractor.

To help you with your scaffolding and concrete shoring methods, PS offers a complete nation-wide engineering service available to you locally. See the Yellow Pages in your 'phone directory for the nearest Patent Scaffolding office or representative that sells and rents "Gold Medal" Scaffolds.

FOR GREATER SAFETY...EFFICIENCY...ECONOMY

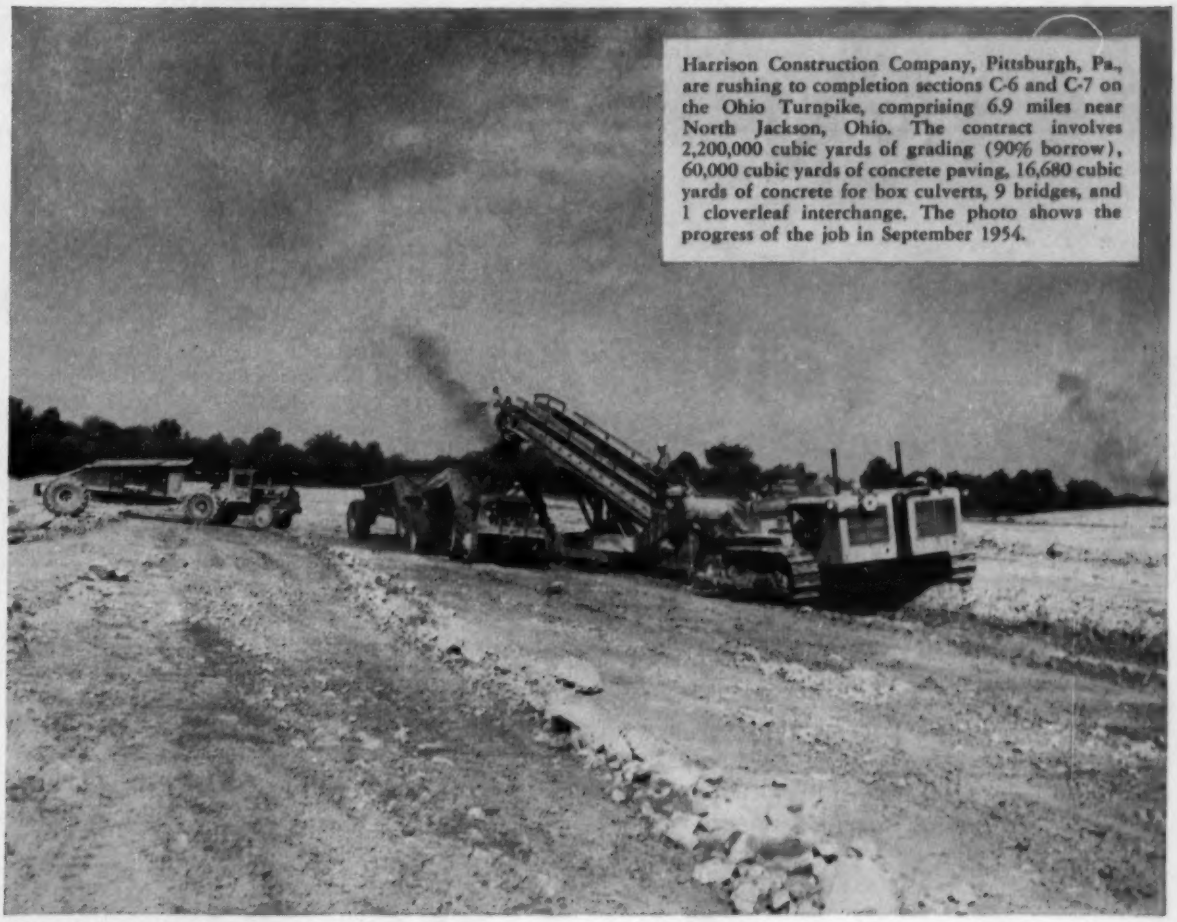
THE PATENT SCAFFOLDING CO., Inc.

38-21 12th Street Dept. CM&E, Long Island City 1, N. Y.
West Coast: 6931 Stanford Ave., Los Angeles 1, Calif.
Branches in all principal cities
In Canada: 355 Dufferin St., Toronto

GULF PRODUCTS *and* FINE SERVICE

keep equipment rolling

on the Ohio Turnpike Project



Harrison Construction Company, Pittsburgh, Pa., are rushing to completion sections C-6 and C-7 on the Ohio Turnpike, comprising 6.9 miles near North Jackson, Ohio. The contract involves 2,200,000 cubic yards of grading (90% borrow), 60,000 cubic yards of concrete paving, 16,680 cubic yards of concrete for box culverts, 9 bridges, and 1 cloverleaf interchange. The photo shows the progress of the job in September 1954.

THE Ohio Turnpike is another big and important project where a large percentage of the participating contractors rely on Gulf to keep their equipment on the job and operating smoothly.

Contractors like Harrison Construction Company, for example, appreciate the clean-burning, high performance properties of Gulf gasoline and Diesel fuels—also Gulf's prompt delivery service.

Let us discuss with you how Gulf's quality service and fine products can help you on your next job. They are quickly available to you through more than 1400 warehouses located in 31 states from Maine to New Mexico.

GULF OIL CORPORATION
1822 Gulf Building

GULF

GULF REFINING COMPANY
Pittsburgh 30, Pa.

THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS

The Difference in OWEN Grapples

How can Owen Grapples *grasp* odd shaped stones and *hold* them securely under seemingly impossible conditions?

The answer is easy and logical...Owen is the *only grapple in which each tine operates independently.*

When power is applied all tines move toward the center. The one first meeting strong resistance grips and the others continue to move until each meets similar opposition. The result is tremendous gripping power and ability to grasp and hold objects regardless of their unusual shapes.

Send today for the Owen Rock Grapple Bulletin which explains this exclusive patented principle and illustrates many interesting handling operations.

THE OWEN BUCKET CO.

[illegible] Breakwater Avenue [illegible] Cleveland 7, Ohio
[illegible] New York, Philadelphia, Chicago, Berkeley, Portland, Fort Lauderdale, Fla.

IT'S YOUR BUSINESS . . .

Continued from page 26

total unclassified contracts. Smaller firms, on the other hand, increased their contract dollar volume.

More Sewerage, Bridge Contractors, but Less Work

Sewerage construction and bridges also drew on more contractors in '54 than in '53 although volume of contracts was lower. There were 4% more contractors, 851, taking on 1,382 sewerage jobs costing $376 million. While the number of sewer jobs was 8% above '53, total dollar value dipped 4%.

Dollar volume of bridge contracts dropped 34% to $448 million, but the number of contractors in this line increased 2% to 681 firms. The number of projects available was 1% higher than a year before, numbering 1,030.

Airport construction volume perked up in '54 but 7% fewer contractors signed up airport contracts. The 605 firms handled 837 projects, 7% fewer than in '53, for a total volume of $530 million, up 7%.

Fewer Building Contractors

In contrast to the 5% increase in heavy construction contractors doing other than buildings in '54, the number of building contractors doing $100,000 or more dipped 2% to 5,621 firms. All of this decline was in the number of firms handling industrial building which slumped 27% in contract volume during '54.

Contractors doing other types of building construction increased 5% to 2,633 and had a 2% increase in contract volume to $3.7 billion. Million-dollar firms increased the most, by 7% to 1,061, while the number of smaller firms in this line also increased 4-5%. All size groups had more contract volume than in '53, with the biggest increase chalked up by $100,000 to $500,000 firms which upped their volume by 5%.

In industrial building, the number of million-dollar contractors dipped 4% to 480. But smaller firms dropped out much faster. There were 27% fewer industrial building contractors in the $500,000 to $1,000,000 bracket and 19% fewer $100,000-$500,000 firms.

CONTRACT AWARDS BEGIN ON PAGE 189

Now...

from Caterpillar

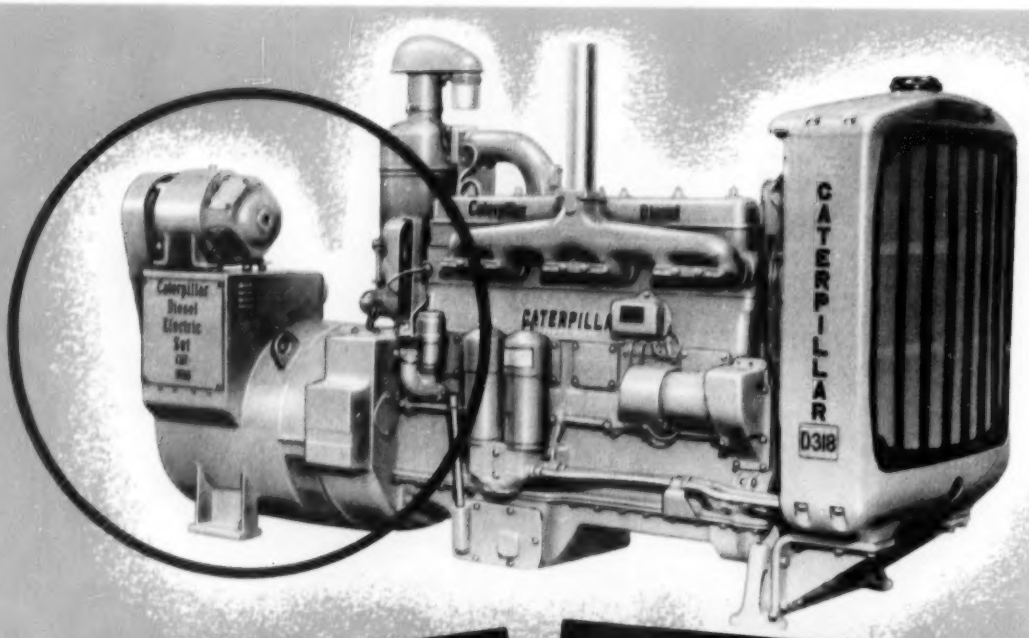
...a major

development

in

MODERN ELECTRIC POWER

The new
CATERPILLAR

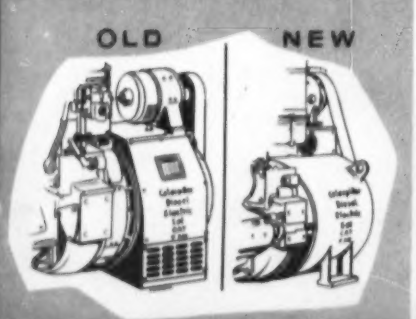


Nothing like it for simple operation, flexible application, compact power, rugged construction, long life and ease of maintenance.

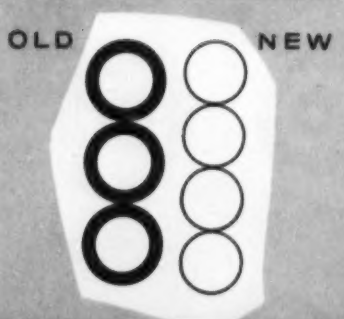
Heart of the new line of Cat Diesel Electric Sets, providing in one package the best features of self-regulated and externally-regulated generator plants—you get more for your money.

Easily paralleled with other generators now in use.

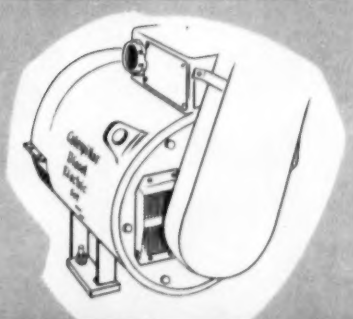
There is a big difference in size between the old and new Caterpillar Generators.



New insulation permits more compact design—exaggerated comparison in illustration below.



New design saves space. Leads can be taken from side, back or top without affecting machine width.



GENERATOR

Here is a new concept in generators – an advance that stems both from Caterpillar research and practical experience in the field of electric power.

Combining latest developments in design, materials and production, it brings to Caterpillar's new line of Diesel Electric Sets the efficiency of the externally-regulated set in a self-regulated set–you get more for your money.

These rugged power packages provide you with many new advantages. Here are a few of many features that add up to a new standard of efficient, economical performance:

- **Close regulation of voltage—no load to full load.**
- **Easy to start—require no operating adjustments. Anyone can run them.**
- **Extremely compact—big electrically, packing more power in smaller space than old style units.**
- **Easily paralleled with other generators now in use.**
- **Like all Caterpillar-built equipment—100% backed by Caterpillar.**
- **Sold and serviced by one reliable source—your nearby Caterpillar Dealer.**

Whatever your power requirements, it will pay you to look into the new Cat Diesel Electric Sets with their advance-design generators. Get the full facts about them from your Caterpillar Dealer.

MAJOR ADVANTAGES OF THE NEW CAT GENERATORS

1 **MATCHED TO ENGINE PERFORMANCE.** Each Cat Generator is designed and built to exactly match the Cat Engine powering it, assuring maximum efficiency in a simple, complete package.

2 **SELF-REGULATING, WITH CLOSE VOLTAGE REGULATION.** Designed to meet the needs of applications now served by self-regulated or externally-regulated generators, this new generator provides steady voltage from no load to full load.

3 **ADJUSTABLE FOR SPECIAL CONDITIONS.** During initial installation, the terminal voltage and voltage "droop" can be adjusted to meet the special conditions of the application. After that, the adjustments are locked and no further adjustments are necessary.

4 **EASY TO INSTALL.** No complicated switchgear or external voltage regulators are needed.

5 **VERSATILE IN APPLICATION.** Easily paralleled with other generators now in use.

6 **SMALL AND COMPACT.** Occupy less space than other generators. A reduction in frame size, close coupling, top-mounted exciter results in a shorter over-all package length.

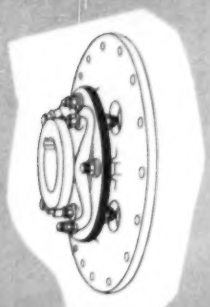
7 **BIG ELECTRICALLY.** Motor starting ability — capacity to handle the surge of heavy loads.

8 **EASY TO MAINTAIN.** Heavy-duty, single-bearing, close-coupled construction. The single bearing is easily accessible and is lubricated from an oil reservoir that requires filling only once a year.

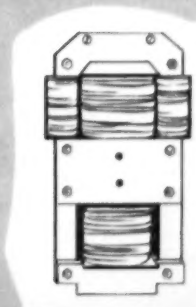
9 **RUGGEDLY CONSTRUCTED.** Heavy-duty, laminated pole rotor for improved operation and increased rotor life.

10 **DESIGNED FOR LONG LIFE.** Built to match the long life of the Caterpillar Engine powering them.

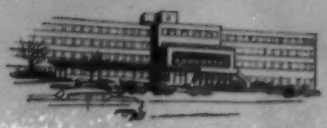
Disc-type coupling and single-bearing design save space. Single bearing is easily accessible.



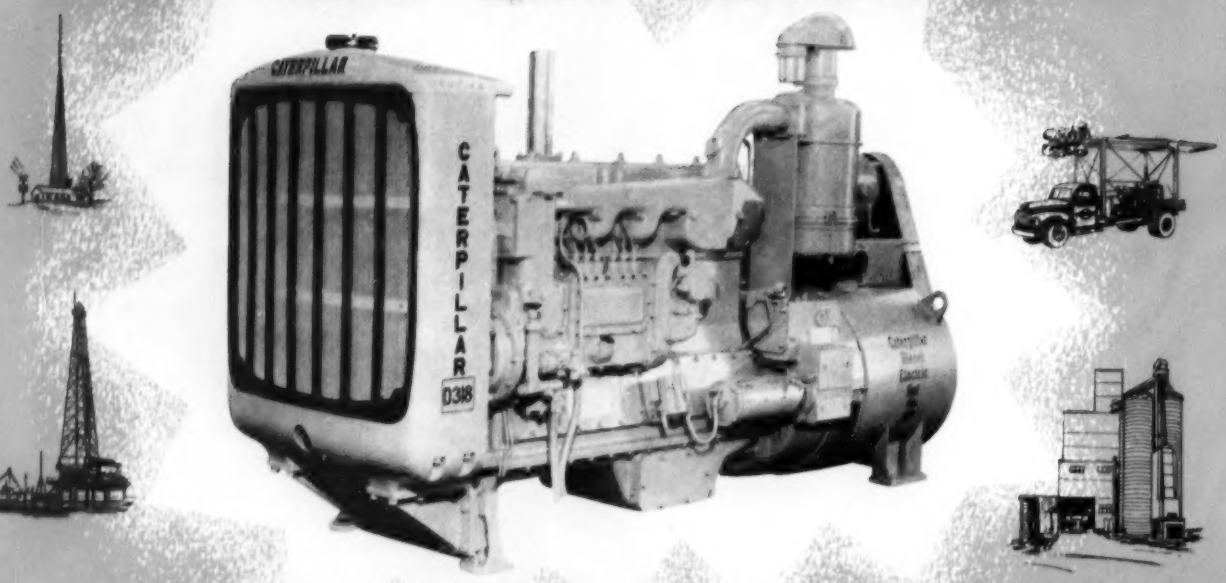
The "regulator" of the Caterpillar Generator. No moving parts — compact — reliable.



The control panel—adjustments locked at installation. No further attention required.



The new CAT* Generator



. . . another example of Caterpillar leadership in action

In 1939, Caterpillar introduced the first Cat self-regulated Electric Set.

At the time, this was a new concept in diesel-electric power.

Like most new developments, it had to win acceptance against "old, hidebound, traditional prejudices and practices."

It won acceptance — quickly and with outstanding success!

Just look at the record: since 1939, thousands of Cat Electric Sets have delivered long, reliable, economical service in widely different applications in every corner of the world. Sets with many thousands of hours of profitable operation are not uncommon. Many with more than 100,000 hours on their meters are still in use and going strong.

No matter how old they grow, not a single one ever becomes a "parts orphan." Like every Caterpillar-built machine, genuine Cat parts will be available as long as you have a need for them.

Now Caterpillar introduces another new concept in diesel-electric power—a new and better generator, heart of the new line of Caterpillar Diesel Electric Sets.

Like that 1939 "new concept of diesel-electric power," this is also backed 100%.

New design, new materials and new production techniques have made it possible for you to get more for your money in the new power packages.

See your Caterpillar Dealer about the new line today!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Cat and Caterpillar are Registered Trademarks of Caterpillar Tractor Co., U. S. A.

NEW HEAVY-DUTY ELECTRIC SETS

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CATERPILLAR TRACTOR CO., Peoria, Illinois, U. S. A.

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Du Pont announcement

Exclusive "ZEREX" Analyzer helps you CUT ANTI-FREEZE COSTS up to 50%

After years of research, Du Pont has developed a "Zerex" Anti-Freeze Analyzer Kit that you can use *right on the job*—to tell how much reserve alkalinity (protection against corrosion) remains in a used "Zerex" solution!

By telling you which solutions you can safely continue to use—and which ones should be replaced—the Analyzer can reduce your cooling-system maintenance expense and cut your anti-freeze costs as much as 50%.

The Analyzer can also become the core of a cost-cutting preventive maintenance program. By telling you which anti-freeze solutions are worn out and should be replaced with a fresh "Zerex" solution, the Analyzer helps you prevent costly damage to the vital parts of the cooling system.

Just add these savings to those already possible by pre-mixing "Zerex" and you know why "Zerex" is your best anti-freeze buy—bar none! And remember, only "Zerex" can be safely analyzed on the job with Du Pont's exclusive Analyzer.

ZEREX
REG. U. S. PAT. OFF.
Anti-Rust ANTI-FREEZE

DU PONT
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BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

SPECIAL OFFER

We will *demonstrate* the cost-cutting features of the "Zerex" Analyzer—at no obligation. Just fill out and mail the coupon below.

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2494 Nemours Building, Wilmington 98, Delaware
I'd like a "Zerex" Analyzer "cost-cutting" demonstration!

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Firm_____
Number of Units_____
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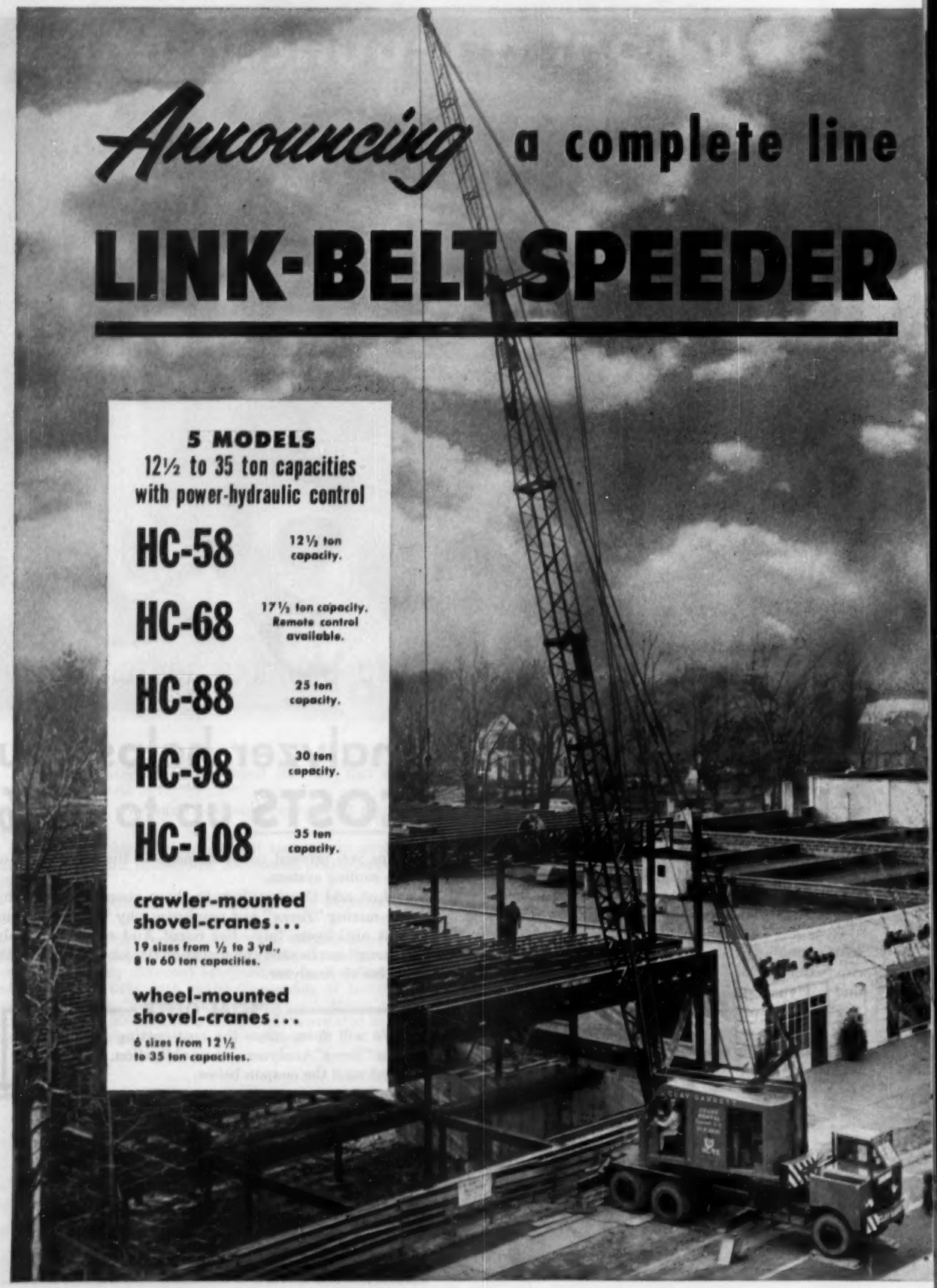
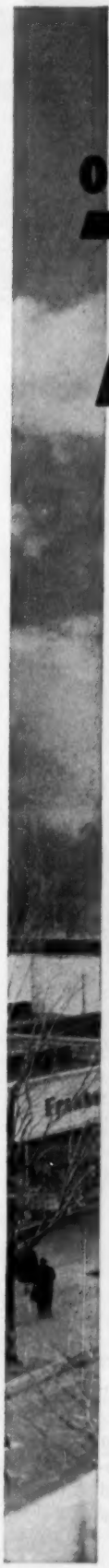
City & State_____


Announcing a complete line
LINK-BELT SPEEDER
5 MODELS
12½ to 35 ton capacities
with power-hydraulic control
HC-58
12½ ton capacity.
HC-68
17½ ton capacity. Remote control available.
HC-88
25 ton capacity.
HC-98
30 ton capacity.
HC-108
35 ton capacity.
crawler-mounted shovel-cranes...
19 sizes from ½ to 3 yd., 8 to 60 ton capacities.
wheel-mounted shovel-cranes...
6 sizes from 12½ to 35 ton capacities.



# of new, advanced-design Truck-Cranes

Zephyrcranes

The new line of Link-Belt Speeder truck-mounted Zephyrcranes features Speed-o-Matic —the true power-hydraulic control system. Fingertip-operated, this Link-Belt Speeder exclusive provides fast, easy, positive response, perfect "feel" for speed with accuracy. And because it greatly reduces operator fatigue, keeps him alert . . . you increase safety and your operator is able to maintain greater output with less effort.

Check these features

- **SPEED-O-MATIC REVERSING CLUTCHES** are available for either or both main drums . . . provide power load lowering of main hoist line and jib whip line.
- **THIRD DRUM** available for HC-88, HC-98, HC-108, is valuable for piledriving applications.
- **SELF-COMPENSATING CLUTCHES** adjust for heat and normal lining wear.
- **ALL CLUTCHES ARE INTERCHANGEABLE** (within each model) with exception of front drum reversing clutch on HC-58 and HC-68.
- **INDEPENDENT, RAPID BOOMHOIST** with power raising and power controlled lowering through Speed-o-Matic boomhoist and lowering clutches is standard on HC-88, HC-98 and HC-108. Available for the HC-58 and HC-68.
- **PATENTED RETRACTABLE HIGH GANTRY** is quickly raised or lowered under power. Raised, it reduces stresses on boom and boomhoist cable. Standard except on HC-58 and HC-68.
- **GREATER "NET" HORSEPOWER.** Heavier components plus use of anti-friction bearings, splined-shafts and precision-machined parts permits converting more rated engine power into usable (net) horsepower or actual line pull.
- **COUNTERWEIGHT REMOVAL DEVICE** using Speed-o-Matic hydraulic jacks, speeds removal and installation of counterweight. Available on HC-88, HC-98 and HC-108 only.
- **HYDRAULICALLY CONTROLLED SWING BRAKE** — Standard on HC-88, HC-98 and HC-108.
- **FULLY CONVERTIBLE** to all standard front end attachments.
- **REMOVABLE REAR OUTRIGGER** permits easy, quick changeover for shovel, hoe or dragline operations.
- **TORQUE CONVERTER** power units available.

MOUNTED ON SPECIALLY DESIGNED CARRIERS

Zephyrcrane carriers are advance-designed, offer many features including:

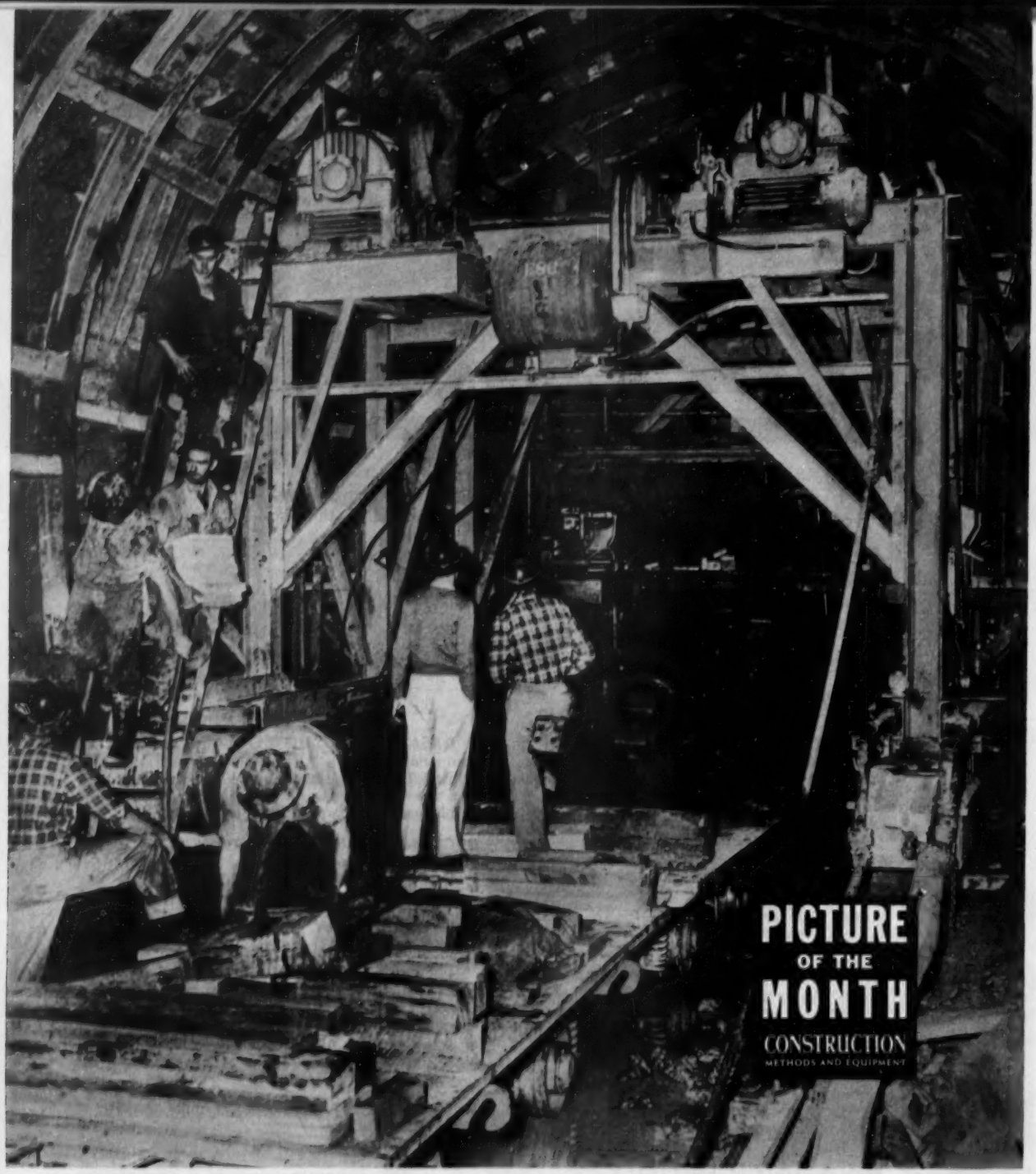
- ✓ Removable rear outrigger.
- ✓ Full floating walking beam support for rear wheels.
- ✓ Screw-type outrigger jacks and pontoons, available.

For complete details contact your distributor or write direct. Be sure you get the free 12-page booklet "The Inside Story" . . . for full facts on why Speed-o-Matic cuts costs, boosts output up to 25% or more.

LINK-BELT SPEEDER

Link-Belt Speeder Corporation, Cedar Rapids, Iowa 13,060

Builders of a complete line of crawler and rubber-tired shovel-cranes



Set Underground Record Down Under

BY TUNNELING 402 FT in six days, U.S. construction crews in Australia have set a new world's tunnel-driving record. The 24-ft dia bore goes through a complicated geological structure of quartzite, slate and granite that requires steel-rib ground support. And the tunnel face was some 3,000 ft in from the portal at the time the record was hung up. From the jumbo shown above, 10-ft rounds were drilled to pull better than 9 ft and give 160 yd of muck. The tunnel—the Eucumbene-Tumut—is part of the Snowy Mountain Hydro Project being built by Kaiser-Walsh-Perini-Raymond, a U. S. seven-firm joint-venture. A future article will describe the tunneling methods that established the new record (previous one was 363 ft, set by Walsh Construction Co. on California's Pit 4 Project in 1953).

WHEN CONSTRUCTION JOBS · CALL FOR SOIL COMPACTION

BARCO is the ANSWER!

WHEN YOU'RE FIGURING FOR THE "LOW BID"—No other tool can give you the economy and dependability offered by Barco Rammers on high degree soil compaction for all kinds of projects—Atomic Energy, Hydroelectric Power and Flood Control Dams, Highways, Toll Roads and Freeways, Airports, Bridges, Buildings, and Housing Developments!

WHEN YOU HAVE TO MEET TOUGH SPECIFICATIONS—In test after test, Barco Rammers have demonstrated their ability to deliver 95% to 97.5% compaction (modified Proctor Method)—EASILY! EFFICIENTLY! ECONOMICALLY! The Barco Rammer is especially useful for compacting fill in restricted areas. ONLY the Barco Rammer can produce specified high degree compaction on lifts up to 20 inches.

WHEN YOU'RE UP AGAINST A TIGHT SCHEDULE—One of the biggest advantages offered by Barco Rammers is ability to handle work in minimum time. On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On trench backfill, using lifts up to 24", the rate for 18" trench is 360 to 600 feet per hour. *When time is at a premium, BARCO PERFORMANCE PAYS DIVIDENDS*—find out about it NOW!

BARCO *GASOLINE* RAMMER

For Soil Compaction Close to Walls, Culverts and Abutments —in Trenches, Ditches

BARCO MANUFACTURING CO.
5122 Hough St., Barrington, Illinois

Gentlemen:
YES! I want to know about Barco Rammers for Soil Compaction:

Name _____

Company _____

Address _____

☐ Please send me the name and address of your nearest dealer.

☐ Without obligating me, I would be interested in a DEMONSTRATION.

☐ Please send General Catalog No. 621.

☐ Please send free bulletin on "SOIL COMPACTION COST DATA."

ZERO Slump in ZERO Weather

It takes a NORTHERN winter to separate the men from the boys . . . and it takes real low slump concrete to show the mixing and discharging ability of a truck mixer. Smith De Luxe Mixers are known for their ability to handle zero slump concrete at any time of the year . . . even in zero weather.

You know that low slump concrete resists flow. It doesn't slide down the discharge blades easily. The Smith Mixer makes the tough, low slump jobs easy. It is designed to handle the stiffest and stickiest low slump concrete, every month of the year regardless of weather. Smith Mixers are built in all sizes and are guaranteed to agitate their full rating according to Truck Mixer Bureau standards. Contact your nearby Smith distributor for literature, or write:

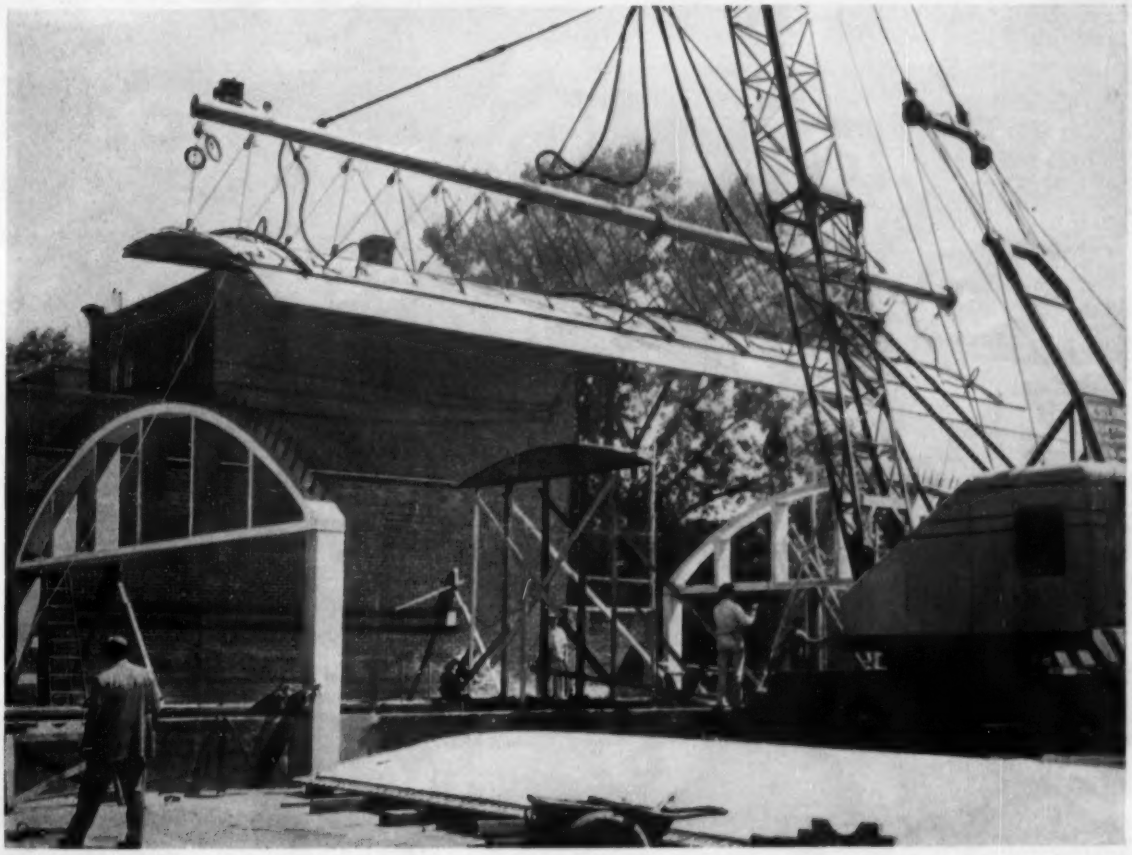
THE T. L. SMITH COMPANY, 2851 N. 32nd St., Milwaukee 10, Wis., U.S.A.

Affiliated with Essick Manufacturing Company, Los Angeles, California

SMITH
THE T. L. SMITH CO. MILWAUKEE, U.S.A.

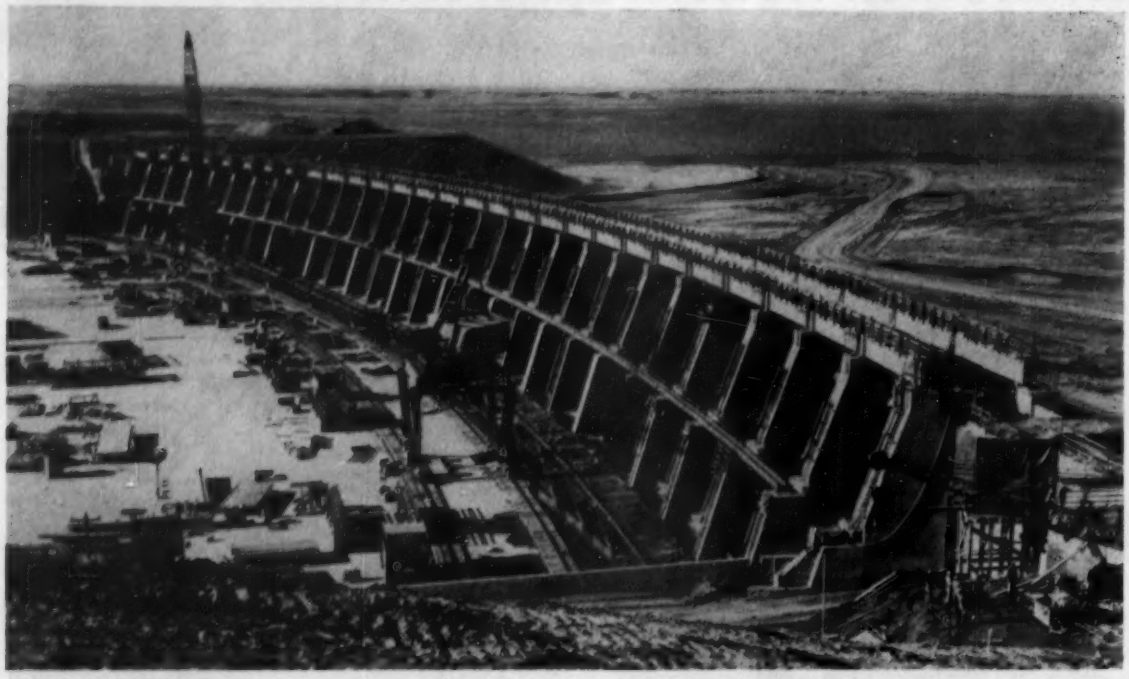
Builders of Better Mixers for More Than 50 Years

Construction News in Pictures...



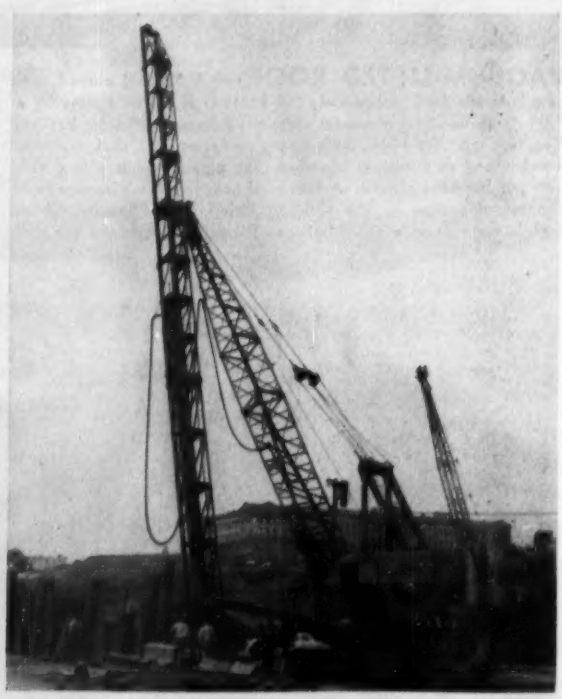
VACUUM-LIFTED ROOF — A 50x20-ft curved precast concrete roof section only 2½ in. thick is set on trusses by a P&H crane handling a special vacuum lifter developed by Vacuum Concrete Inc. The 10-in., 50-ft long pipe serves both as a structural member and as a vacuum chamber. The pipe connects with a vacuum pump on the ground. A system of pulleys with ¼-in. wire rope connects the pipe to the plywood lifting pads. Sponge rubber seals-in the vacuum created between the suction pads and the roof section. The vacuum lifter attaches to a stacked thin-shell section by atmospheric pressure, and the lift is supplied when the vacuum pumps are turned on. By adjusting the pulley system from the ground, it is possible to lift the shell section at the exact angle desired to fit it properly to the trusses. When a section is in position, it is connected by poured-in-place joints. The roof sections are reinforced with double layers of mesh over the entire surface and by 18½-in. steel rods. Each section weighs approximately 15 tons.

LOTS OF POWER — A twin-engined 388-hp Euclid TC-12 push-loads a Euclid TS-18 scraper on Indiana Turnpike job. Because of heavy sand, Western Contracting Corp., of Sioux City, equipped scrapers with oversize 300-hp engine for front drive wheels in addition to the standard 194-hp engine at rear. Scrapers travel up to 30 mph over sand with full payload. *(More photos on next page)*



SAFETY FIRST — The spillway for North Dakota's mammouth Garrison Dam is scheduled for completion this month, and safety is still the watchword. Last year the job was given the AGC's first prize for safety in heavy consruction. Its safety record still shows a frequency rating of only 3.89 for 770,925 hr of exposure. The spillway, built by Garrison Spillway Contractors, is part of the largest earth-filled dam embankment in the world. Crossing the Missouri River, the project is 2½ mi long, 2,600 ft wide at its base.

FLOATING FOUNDATION — A 3½-ft. "floating" concrete foundation takes the place of piles at Chicago factory site. The monolithic slab of 1324 yd of concrete had to be laid in a continuous pour. A 1¾-yd Lorain crawler and a Lorain MC-824 Moto-Crane handled the pour in a single daylight shift.



STANDARD TRACKS — A Bucyrus-Erie 54-B crane uses 130-ft leads to handle a 9½-ton pile hammer battering-in 120 ft of 16-in. pipe to depth of 100 ft. Despite long leads, crane is mounted on standard 15x3 ft tracks instead of the longer tracks normally used on pile-driving operations.

With a Homelite on the Job

Work speeds up . . . costs go down . . . always! Because a lightweight, carryable Homelite gives you instant, efficient power any place you need it . . . power for operating every type of electric tool or bright, flickerless floodlighting. Here, for example, a Homelite gasoline engine driven Dual Purpose generator, operates a standard universal power saw and a one man high cycle concrete vibrator *both at the same time*. Write for complete bulletin showing many ways to cut time and costs with Homelite Carryable Generators.

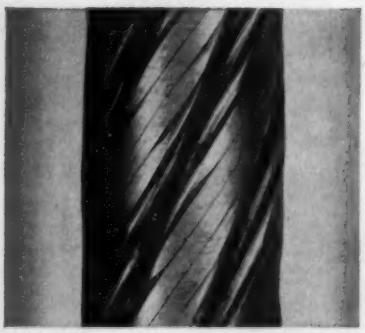
HOMELITE CORPORATION

1008 RIVERDALE AVENUE • PORT CHESTER, N. Y.

Tuffy® tips on the "lays" and

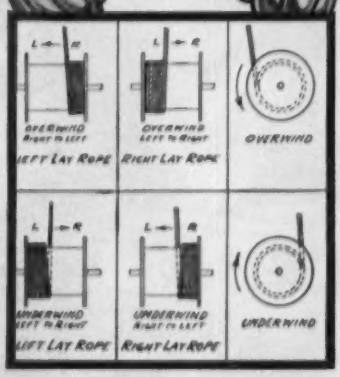
Partially Worn Regular Lay

Regular Lay ropes are used to a greater extent than Lang Lay, because Regular Lay wire ropes stand up better under the hazards of installation and use. Regular lay ropes are less susceptible to drum crushing and are not so readily damaged on sheaves of small tread diameter.



Partially Worn Lang Lay

Lang Lay ropes are about 15% more flexible than Regular Lay, and have a wearing surface *per wire* about three times as great. However, they crush out of shape more easily on small drums and are more easily damaged by sheaves with small tread diameter.



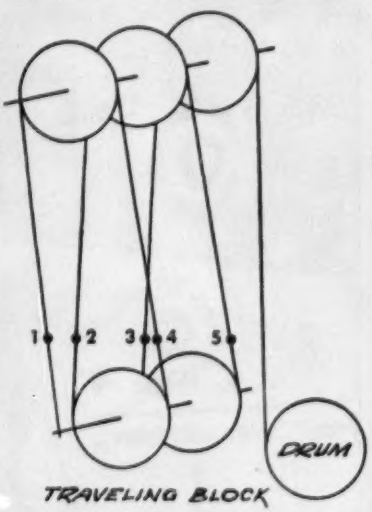
Rope Lay for One Layer Winding

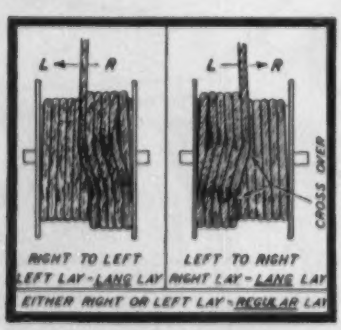
These diagrams show when it is best to use right lay or left lay rope on one-layer winding. The direction of winding is determined by standing behind the drum, looking toward the direction of the rope travel.

How To Count The Number of Parts Supporting the Load

The wire rope on many machines is not used in a single part or direct pull. It is often reeved through sheaves, which multiplies the power applied to the load. Drawing an imaginary line across the reeved rope parts, above or below the "crossing", and counting across gives you the number of parts supporting the load. Always include the rope end to the block, but not the part leading to the drum.

Send For Free Chart Which Allows Easy Figuring of Actual Stress On Rope For Any Given Piece of Machinery Reeving From One to Eight Parts.



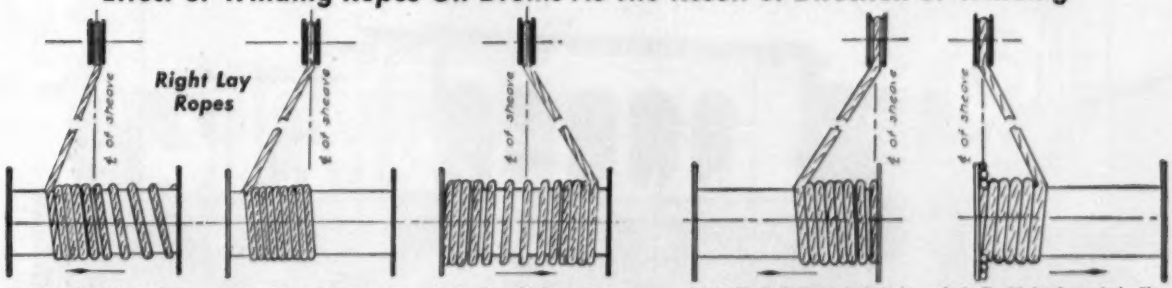


Rope for Two Or More Layer Winding

When a rope winds on the first layer across the face of a drum, it usually travels in a uniform pattern. But when it reaches the flange of the drum, the rope rides on the last strand of the first layer for one turn. Then, it slips into the grooves between each course of rope on the first layer. To move across the drum in this manner, the rope actually winds *back* a turn in each revolution. Then it must jump across *two* grooves in the first layer. This always occurs on the even-numbered layers, and often causes crushing. This abuse is minimized by use of properly designed grooves, spacers and lifters.

reeving of Wire Rope

Effect of Winding Ropes On Drums As The Result of Direction of Winding



Right to Left Overwind. Rope winds open to centerline of the drum, then it winds close.

Overwind. Allowed to run freely, the rope winds close to the left from center of drum.

Left To Right. Rope winds close the first four turns, open to center of drum, then close.

Right To Left Overwind. First two turns about 3/16" open, the balance close. Does not build up on flange.

Left To Right Overwind. The rope will build up three to four turns on flange before crumbling, then wind close.

Yours For The Asking—The "Know How" of Specialists

Put your problems up to Union Wire Rope technicians who work closely and continuously with users and machine manufacturers to lengthen the service life of wire rope through both design and application.

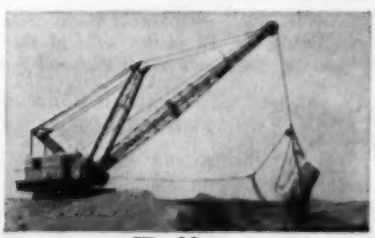
Out of this exhaustive research has come the industry's greatest advancement—the Tuffy family of special purpose ropes that offer you the construction, operating characteristics and grade of steel that are best for the particular job for which each is constructed.

So thoroughly have the ropes of the Tuffy family been engineered that the chances of ordering the wrong rope is virtually eliminated. When you order Tuffy wire rope, you...

Stop Specification Complications—Say Tuffy

Tuffy Scraper Rope

Mount a reel on your scraper and get full service out of every foot. Specially constructed for scraper service where complex destructive forces overwhelm ordinary rope.



Tuffy Dragline

Flexible enough for easy casting, tough enough to give you maximum abrasive resistance and service life in handling wet or dry, hard or soft materials.

Tuffy Dozer Rope

Has the stamina needed to stay on the job after ordinary ropes are thrown away. In 1/2" or 9/16" size on 150' reels for easy mounting to facilitate cut-off without waste.

Tuffy Slings & Hoist Line

Slings of the famous Tuffy machine braided, kink-resisting, 9-part construction, cut replacement costs. For balanced performance, team them up with Tuffy Hoist Line.

Your Tuffy Distributor: Dependable Source of Information.

His job is more than just supplying the wire rope you want—when you want it. Your Tuffy distributor is always on the alert to help make your equipment do the best possible job, at the lowest possible cost. When you have a problem that calls for special knowledge concerning your equipment that uses wire rope, give your Tuffy distributor a call. He'll be glad to furnish the help you need including factory engineers.

union Wire Rope corp.

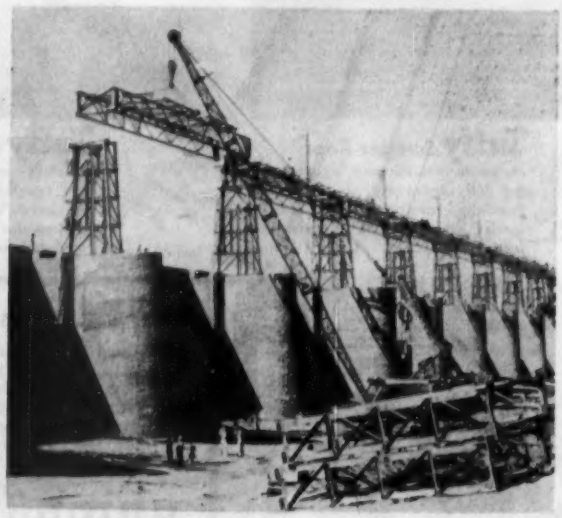
2174 Manchester Avenue, Kansas City 26, Missouri

3-C *Specialists in High Carbon Wire, Wire Rope and Braided Wire Fabric*

CONSTRUCTION 'ROUND THE WORLD

FAMOUS LANDMARK — Two Allis-Chalmers HD-5G tractors with hydraulic shovels are being used in Vienna, Austria, to excavate for a new building to be erected in the shadow of the world-famous Vienna State Opera House shown in the background. Foundation walls of the demolished building in the foreground were 6½ ft thick and consisted partly of natural rock.

MOROCCO AIR BASE — Work on the $23 million air base being constructed at Boulaut, French Morocco, has progressed to pouring concrete for runways. Base is one of a chain being built under supervision of the Corps of Engineers, U.S. Army.



PAKISTAN DAM — With the opening of the Ghulam Mohamed Barrage is marked the end of a nine-year construction period to harness the River Indus in Pakistan. The barrage is 3,000 ft long, has 44 spans with gates 21 ft deep. Cost was $17,393,750.

Drilling Superintendent Reports:

"JOY CHALLENGER DRILLS SAVED THOUSANDS OF DOLLARS ON OUR DAM PROJECT"

Two Joy TWM-3 Challenger Hammer Drills were tried on this project after difficulty had been experienced in maintaining drilling schedules. Six 4" Wagon Drills had been barely able to keep the 3-yard shovel in rock.

The Two Joy Challengers not only easily kept ahead of the shovel, but also reduced labor and powder costs. The contractor was so impressed with this performance that he added a *third* Challenger when it became necessary to increase the depth of cut to 100 ft.

The drilling superintendent then enthusiastically reported that he was saving his company "thousands of dollars" by being able to make this deep cut so economically with his Challenger drills. The table at right compares production figures of the two types of drills.

The revolutionary TWM-3 Challenger is a "package" unit for mounting on a used crawler-tread tractor or similar vehicle. The package consists of mounting brackets, mast, and a powerful 5¼" hammer drill . . . the largest ever built. Maximum hole size is 4½".

For complete details on the Joy Challenger, write for Bulletin 87-U to ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario*

DRILL PERFORMANCE Wagon Drill vs. Joy Challenger		
	1 Wagon Drill	1 Challenger
Bit Size	2½"	4"
Hole Spacing	6' x 6'	15' x 15'
Hole Depth	24' (max)	35' to 40' (later 100')
Footage drilled per shift	200'	180'
Yardage per foot drilled	1½	8½
Yardage per shift	270	1400

Consult a Joy Engineer

for AIR COMPRESSORS • ROCK DRILLS • WAGON DRILLS • CORE DRILLS • BLASTHOLE DRILLS • PORTABLE HOISTS • FANS BLOWERS • HYDRAULIC HOSE AND COUPLINGS

W&D-C9536

JOY

CONSTRUCTION EQUIPMENT MANUFACTURERS FOR OVER HALF A CENTURY

This big POWERHOUSE

Stripping hot mix asphalt from its concrete base without benefit of scarifying! The MICHIGAN also demonstrates its ability to get a heaping bucket load even at ground level—and transport it only a few inches off the ground.

CLARK EQUIPMENT

Push-loading a scraper for A. J. Raisch, San Jose, Cal.—a real test of power and traction. You can use a MICHIGAN where you've never been able to use rubber-tired Tractor Shovels before—versatility that cuts your costs.

handles bigger jobs cheaper!

Look at these specs of the 2¼ yd MICHIGAN 175A

BUCKET CAPACITY	**2¼ cubic yards**
LIFTING CAPACITY	**15,000 lbs.**
HORSEPOWER: Diesel . . . 133; Gas . . . 126; Supercharged . . . 165	
WEIGHT	**24,100 lbs.**
SPEEDS	**Up to 27 m.p.h. Forward or Reverse**

Don't look for "comparative" data on the MICHIGAN 175A —there is *no machine comparable.* This big bruiser is nearly 50% bigger than the next closest machine on the market. It's literally in a class by itself. From fly-wheel to bucket, the 175A is built to do bigger, heavier jobs—jobs that no other rubber-tired machine can handle.

Better traction and flotation. With the MICHIGAN's exclusive power train—300% torque multiplication, power shift transmission (no engine clutch) and planetary wheel axles—you get a shockless flow of power right down to the ground. There's no surge, no wind-up in the axle shaft, no wild wheel spin. The operator has feather-touch control over his wheels; in weak soil conditions or mud, he can ease off or step up the power to keep from digging in. With this kind of smooth power transmission, you get the full advantage of the MICHIGAN's extra weight and power—you dig material *out*, you don't dig the machine *in*.

Independent power at the cutting edge. The 175A bucket action gives you independent power right at the cutting edge of the bucket. With two big double-acting bucket cylinders, you can ease up to a pile of tough material and dig your way into a heaping bucket load. On other machines, you'd have to ram headlong into the pile to try to get penetration—and you'd probably still get only half a load. We'll match the MICHIGAN's digging ability against any make or type of Tractor Shovel, bar none.

Hydraulic power does the work. In spite of its size and power, the MICHIGAN 175A is easier to operate than most machines one-third its size. Hydraulic power does all the real work: power steering, 4-wheel power brakes, power-shifting with two simple levers on the steering column, no clutch pedal.

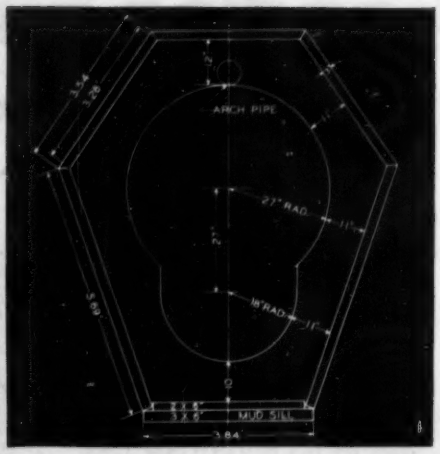
Warning: don't let your operator get on a MICHIGAN unless you're willing to buy one! After an hour on a MICHIGAN, he'll not be satisfied with any other Tractor Shovel.

See it in action! We'll prove that the MICHIGAN is in a class by itself in the Tractor Shovel field: your local MICHIGAN distributor will arrange a demonstration—on your own job, if you wish. Or write for 12-page Tractor Shovel booklet containing explanation and cutaway drawings of the MICHIGAN power train. Any MICHIGAN is available on a low-cost Lease Plan—ask for brochure which explains how you can use it.

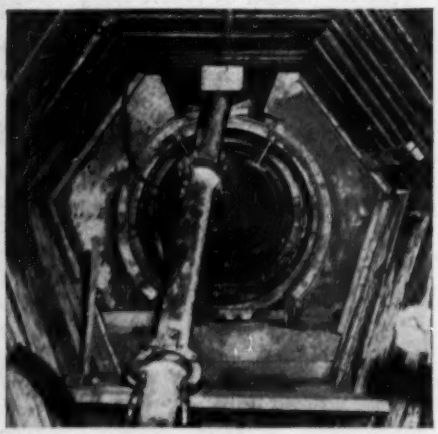
CLARK EQUIPMENT COMPANY, Construction Machinery Division, 380 Second St., Benton Harbor 30, Michigan—Phone WA 6-6184

6000-lb. steel truss, 60 ft. long, is transported from rail siding to steel-setting cranes on Austin Co. job in Michigan. The extra weight and power and inherent stability of the MICHIGAN Tractor Shovel give it the capacity to handle heavy yard-jobs like this.

Cold crusted asphalt tests the digging ability of any machine. Here the MICHIGAN breaks out a 9000 lb. heaping bucket load. When the operator steps on the brake, the power-shift transmission automatically goes into neutral—puts full power into the bucket action.



Here you see a cross section of the tunnel showing construction and measurement details.



Pipeline was laid along bottom of tunnel to forms where it was raised to top for pouring. Note small pipe allows maximum working space in small tunnel area.

Pumpcrete® cuts preparatory and handling costs on Milwaukee sewage tunnel

Above you see the entrance shaft to a 3300-foot concrete tunnel being constructed for the Milwaukee Sewerage Commission by J. W. Lazynski, Inc., Milwaukee contractor. The concrete for this tunnel was placed by Pumpcrete, the pump that pumps concrete by pipeline.

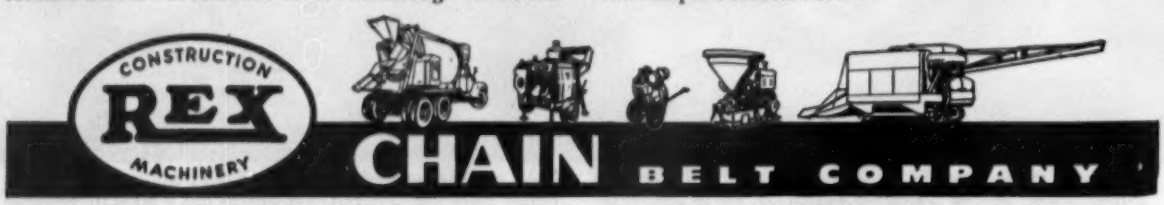
This is how it was done:

The Pumpcrete machine, a Model 160 Single, was located on the surface near the entrance shaft where it was charged by truck mixers. The pipeline was directed down the entrance shaft and along the tunnel bottom to the forms where it was raised to the crown through 45° bends.

The 27" radius tunnel was poured in 60-foot sections and required about one cubic yard of concrete per linear foot.

Long experience with Pumpcrete has taught the Lazynski organization the economy of placing tunnel concrete by pipeline. Pumpcrete not only packs the arch tighter, but handles the concrete faster and cuts expensive preparatory work so necessary with hand-placing methods.

See your Rex Distributor, or write CHAIN Belt Company, 4664 W. Greenfield Ave., Milwaukee 1, Wisconsin, for complete information.



AUGUST, 1955 • VOLUME 37 • NUMBER 8

HENRY T. PEREZ, Editor

CONSTRUCTION METHODS AND EQUIPMENT

Competitive Bidding

IN TWO SEPARATE INSTANCES recently, contracts for important public works have been awarded to others than the original low bidders. And in each case the higher-bidding construction companies receiving the contracts did so only after negotiating new and lower prices. The contract-awarding bodies undoubtedly were acting in what they thought was the best public interest, but this unusual procedure may not, in the long run, serve that high-minded purpose.

On April 15, the Power Authority of the State of New York opened bids for construction of the United States portion of the Barnhart Island powerhouse on the St. Lawrence River. Low bid was $36.2 million, followed by a second low of $37.4 million.

On May 11, the Power Authority announced the award of the contract to the second low bidder—not at his original bid price, but at $35.8 million. While the scope of the work apparently remained unchanged, the $1.6 million reduction was obtained by adjusting downward all but 13 of the 220 unit prices originally bid.

On May 10, the Hydro-Electric Power Commission of Ontario opened bids for the construction of the Canadian portion of the Barnhart Island powerhouse. The three lowest bids were $18.9 million, $22.6 million and $23.3 million.

On June 21, Ontario Hydro announced the award of the contract to the third low bidder—not at his original bid price, but at $21.9 million. The price had been negotiated downward by $1.4 million.

In explaning its award, the Power Authority merely stated that it had followed the recommendations of its consulting engineers. Ontario Hydro said, "Special attention was paid to the existing work loads of bidders, the breadth of their respective experience in this field and the vital importance of strict adherence to time schedules."

Well, the owner has the right to reject any and all bids, of course. But the fact that in these two instances the owners skipped over the low bidders, who were large and well-known firms, might well make other contractors hesitant about bidding on future Power Authority or Ontario Hydro work. After all, bid-preparation costs for jobs of that size run into the tens of thousands of dollars. And it is only prudent to shy away unless there is reasonable certainty that all bidders will be treated alike and that the low bidder will get the contract. If there is doubt in the owner's mind as to the ability of some of the prospective bidders to perform the work properly, he should have all bidders prequalify.

But the awarding of contracts to non-low bidders is only one of the points at issue. After all, many a higher bidder has received a contract, but at his original bid figure. There was no price cutting. Thus the main question here is concerned with the negotiation of prices after sealed bids have been taken and opened.

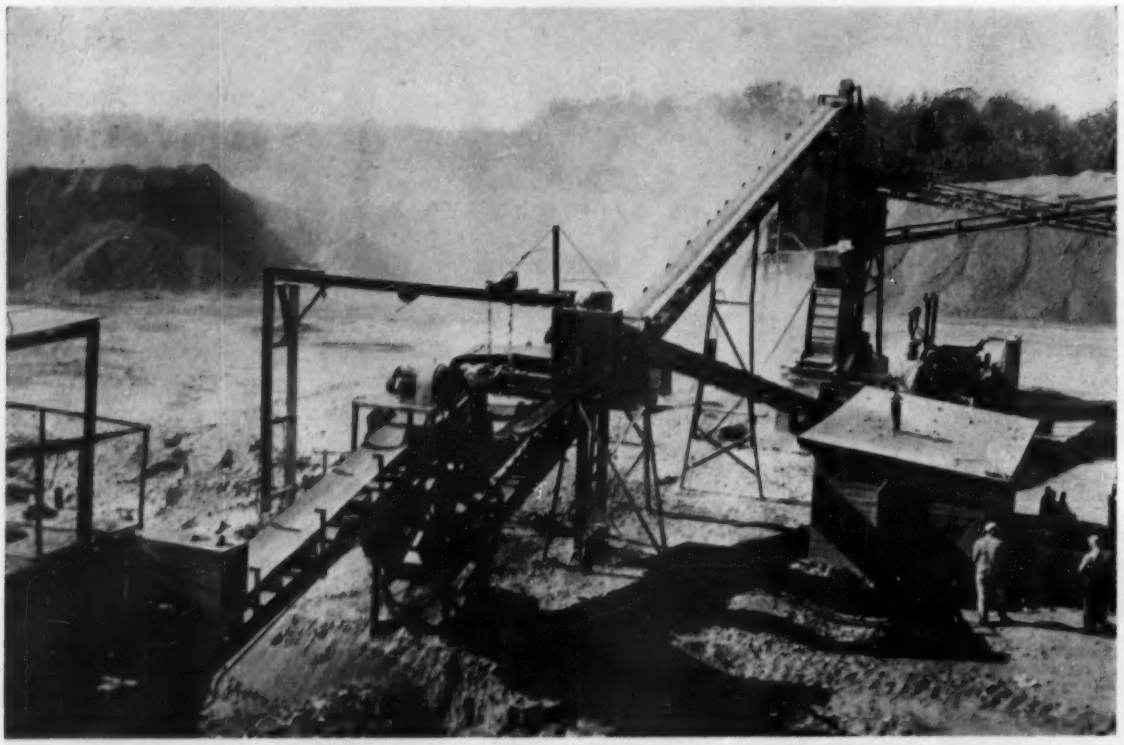
Is the originally tendered bid to be merely a "statement of intent" to the effect that 1) the contractor is interested in the job, 2) he would like to get it at that price, but 3) if the owner doesn't like that price the contractor would be willing to discuss the matter?

Bidding under conditions such as these would be chaotic. And the way would be opened for many of the personal favoritisms, political pressures and other abuses that the sealed-bid competitive system is designed to prevent.

Is not the subsequent negotiation of prices a form of bid shopping? Why bother to call for sealed bids? Why not just auction off the job?

And what of the construction companies who trimmed their bid prices and accepted the contracts at less than their original estimates? How do they get their two sets of figures to jibe?

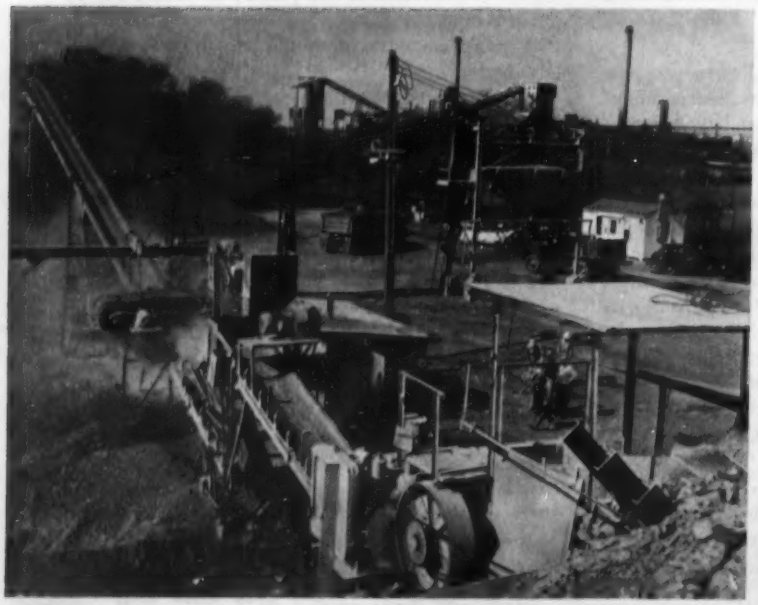
There are many questions raised by this type of unusual contracting procedure. And its far-reaching implications should be explored thoroughly if future lettings are to be conducted similarly. On the surface, such procedure would seem to strike a blow at the very fundamentals of open competitive bidding for public works.



SLAG IS TOUGH TO CRUSH. Even after iron particles are removed with magnets, it is still hard on machinery. Here, slag moves from Pioneer jaw crusher, left, through two electro-magnets, and then to Cedarapids screens and secondary crusher.

How to Work With Slag Aggregates

By ALBERT C. SMITH, Associate Editor



MAGNETIC HEAD PULLEY on first conveyor removes most of iron from slag. The rest is pulled out by magnetized transverse belt over second conveyor. After secondary crushing, coarse particles are conveyed to screening unit and stored in trailer-loading hoppers.

BLAST FURNACE SLAG is an excellent paving material — if you know how to work with it. Slag is lightweight, non-uniform, highly porous, and tough to crush. But if your next blacktop, concrete, or water-bound macadam job is near a steel plant, slag may be your best buy.

The biggest slag job now underway in the East is at McGuire Air Force Base in New Jersey, only 18 mi from U. S. Steel's huge new Fairless Works. Tecon Corp., of Dallas, Tex., has a $2,800,000 contract to construct a 10,000-ft runway with supporting taxiways and apron. And they are doing the entire job with slag. Tecon is using all the slag the huge steel plant turns out. More than 200,000 tons will be made into top-quality aggregates for concrete, blacktop, and water-bound macadam.

Crushing

All slag has to be crushed before it can be used. Tecon has its

crushing plant set up just outside the gates of the steel plant. Only a few days after it is tapped off molten iron, cherry-red slag is delivered to Tecon's stockpile and dumped. (The contractor first tried cooling the hot slag with water, but retained moisture caused it to clog the screens in the crushing plant.) An Allis-Chalmers dozer, its crankcase filled with heavy 90w oil for heat protection, works the hot pile, pushing slag into a hopper. Often, however, sheets of solidified iron must first be bladed or winched out of the way.

From the hopper, slag drops into a Pioneer 2436 jaw crusher powered by a Caterpillar diesel engine. Crushed material falls on to a 30-in. belt convyeor that runs 260 fpm to keep the hot slag from damaging the belt.

Magnets

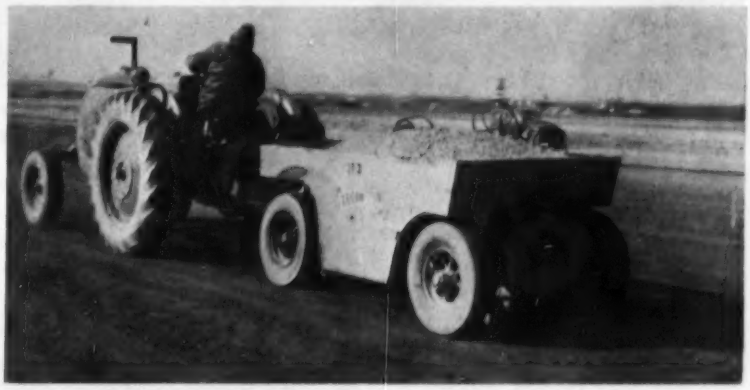
Another problem is removing small pieces of iron out of the slag before they damage the secondary crusher. Tecon does it with two electro-magnets. The first is a magnetized head pulley which separates most of the iron as the crushings spill off the end of the conveyor. The second electro-magnet is set inside a short belt conveyor which runs across and about 4 in. above the main conveyor. Most of the remaining pieces of iron are pulled out here, carried off on the small belt, and then drop to the ground of their own weight.

Crushed slag continues up the second 30-in. conveyor to a Cedarapids screening unit. Here, oversize is sent to an impact breaker, coarse material to a second screening unit, and fine material to a hopper. Occasionally, a piece of iron that gets past the magnets reaches the impact breaker and inflicts considerable damage before it is removed. Tecon is now switching to a cone crusher, which they believe will stand up better.

Coarse material passing through the secondary crusher is screened into two sizes and stored in a double hopper. Besides the fines, the plant turns out ¾-in.-minus material and 1- to 2½-in. material. Production averages between 80 and 100 tph. The plant is powered electrically, except for the two crushers, which are powered by Caterpillar diesels. Trailers haul 20-ton loads about 18 mi to the job.

Slag crushing, therefore, is not easy. But at least you don't have to drill and blast to get raw material.

TRAILER DUMPS 20-TON LOAD of slag directly on ground. Stakes mark limit of dump. Spreader boxes are not used because they cause segregation of lightweight particles.



PNEUMATIC-TIRED COMPACTER rolls 3-in. lift of slag after material is saturated by water trucks and blended by graders. Slag needs lots of water, but makes good base.

GRADER SHAVES top of water-bound slag base to meet rigid grade requirements. Water trucks follow and then steel-wheel roller floats up fines and finishes surface.

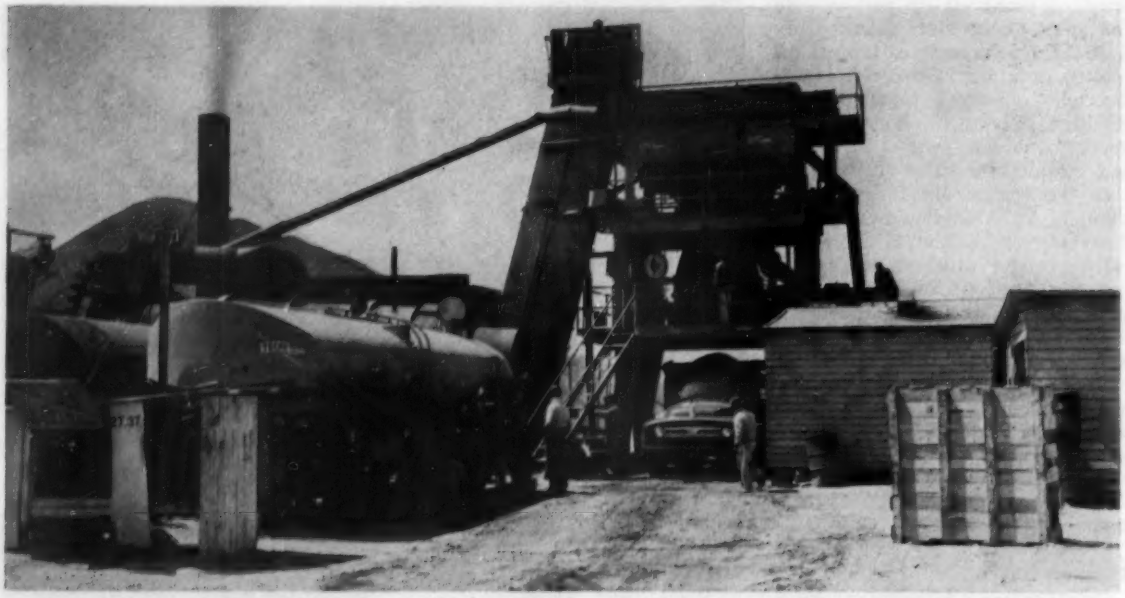
Water-Bound Slag Macadam

More than 45,000 cu yd of slag is going into a 6-in. thick water-bound macadam runway base. Placed in two 3-in. lifts, it makes a high density, stable base.

But it can't be built up like a normal macadam. Spreader boxes cause too much segregation of the lightweight particles. Instead, trailers spread their loads directly on the ground. To keep the trailer from spreading it too thin, stakes mark the limit of each dump.

Because slag has to be saturated for best blending and compacting,

Slag in Black Top...

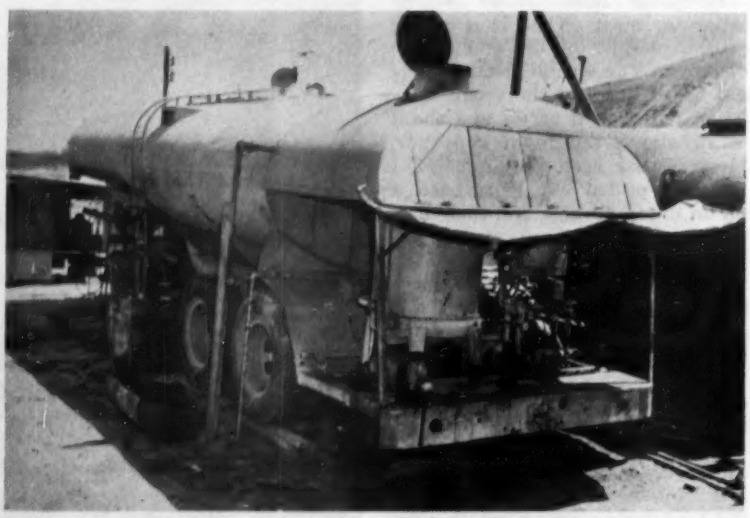


ASPHALT PLANT turns out 4,000-lb batches of bituminous concrete made mostly from slag aggregates. Slag presents no special problems, except when stockpiles get wet. Dryer on Madsen plant has to work hard to dry honeycombs in slag particles.

water trucks follow behind the trailer spraying the dry material. Graders blade the saturated material back and forth until fully blended and then spread it in 3-in. lifts. Best compaction is achieved with pneumatic-tired rollers because they do not crush the surface materials.

Rigid grade requirements are no problem with a slag base. Tecon compacts the top lift to about ½ in. above finish grade. Then they drive steel grade stakes through the base until their tops are at the required elevation. A grader next shaves off the top ½ in., using the steel stakes as guides. Shaving cuts the surface to exact grade without harming the base structure below. Water trucks make another pass, and then steel-wheel rollers finish the surface. The action of the steel wheel floats up the fines and rolls them into a smooth surface.

Slag, therefore, can make a top-notch, high density base. It takes plenty of water, and considerable blending, but it offers the advantage of shaving to the exact grade.



MOBILE STEAM RIG consists of 50-hp Clayton generator mounted on back of tank trailer, which holds both water and fuel for generator. Unit produces steam in 5 min from cold start.

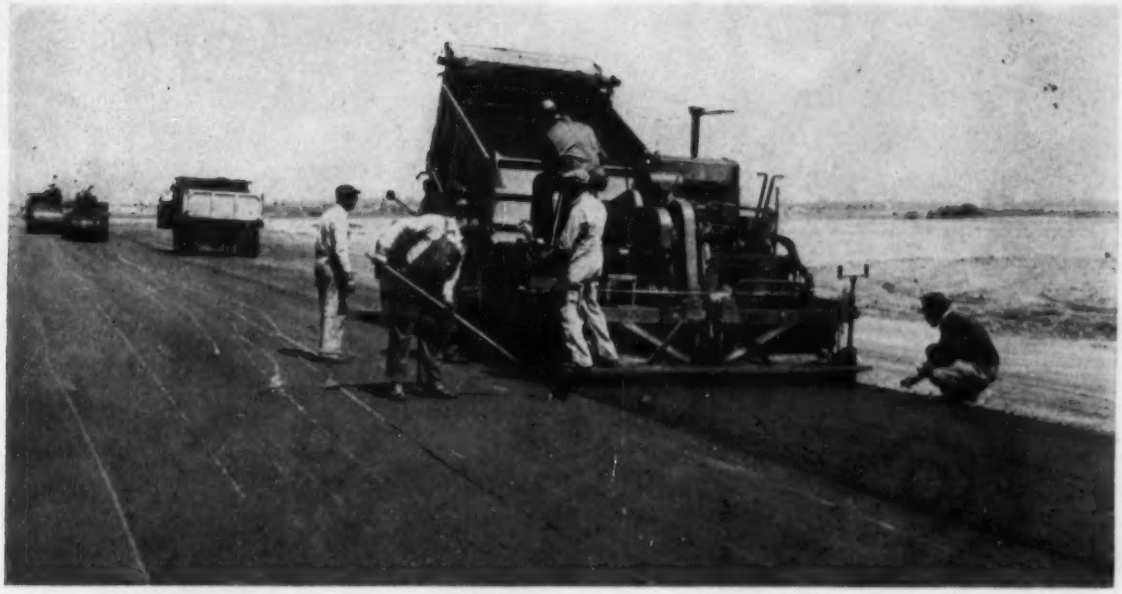
Slag in Black Top

Water, once again, is the big problem with slag aggregates for black-top. If the stockpiles get wet, extra heat is required to dry all the tiny honeycombs in the particles. This slows drying and increases the fuel consumption. Tecon has partially overcome this by covering sections of the stockpiles with tarps when it rains.

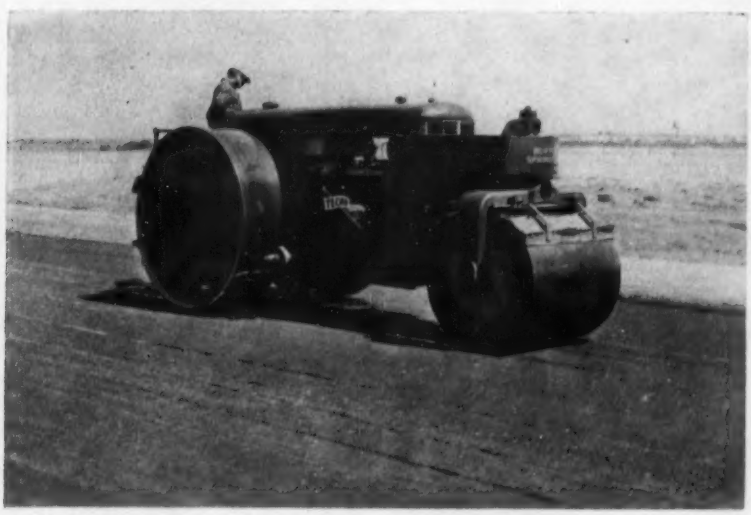
Mix design also must be altered. To achieve proper plasticity, base-course material needs about 7.4% bitumen, and surface course uses 8.5%. Deficiency of fines also demands that sand be added.

Placing is conventional. A Barber-Greene finisher tamps and levels the mix, and a Buffalo-Springfield three-wheel roller follows. A tandem roller works behind the three-wheel to smooth the joint, and a pneumatic-tired roller adds the finishing touches to the pavement.

The asphalt plant is a 4,000-lb batch-type Madsen powered mostly by Caterpillar diesels. A D375 powers the pugmill shaker screen, and hot elevator. It also operates a 75-kva generator which supplies electricity to the motors running the dust collectors and vibrators. A D8800 diesel powers the drier and the cold elevator. The blower



BARBER-GREENE FINISHER lays leveling course of bituminous concrete on section of old runway. Mix must have high percentage of bitumen for proper plasticity. Base courses need about 7.4% by weight and surface courses take up to 8.5%.



THREE-WHEEL 10-TON ROLLER makes first passes behind finisher to seal joint between adjacent strips. Tandem and three-wheel rollers apply finishing touches.

and cold feeder are powered by a D318 engine.

Aggregrates are moved from stockpiles to a cold bin by a Northwest clamshell. A belt conveyor below the bin carries a regulated flow of four aggregates to the cold elevator. From here, the material is dried, screened, batched, mixed with hot bitumen, and dumped into trucks.

Bitumen and fuel oil for the four Hopkins burners are stored in three 10,000-gal insulated tanks jacketed with steam coils. From a cold start, steam is developed in 5 min with a Clayton 50-hp generator. It is mounted on the back of a tank trailer holding both water and fuel oil. The big steam generating unit is both self-contained and portable.

Russel Bodwell is project engineer and Daniel Kovacs is field engineer on all asphalt work for the consulting engineering firm of Porter, Urquhart, McCreary and O'Brien of Newark, New Jersey.

Slag in Concrete

Slag concrete presents few problems to the contractor. It is batched, mixed, and placed by conventional equipment with only a few variations in procedure.

Stockpiles are watered down to reduce the amount of water added at the paver mixer. Too much mixing water causes bleeding in the freshly placed concrete. The resulting mix, therefore, is somewhat dry, and requires a bank of 12 vibrators working behind the concrete spreader instead of the usual eight.

Another problem is a deficiency of fines in the slag. Consequently, the mix design calls for about 40% sand to fill the honeycombs in the slag particles.

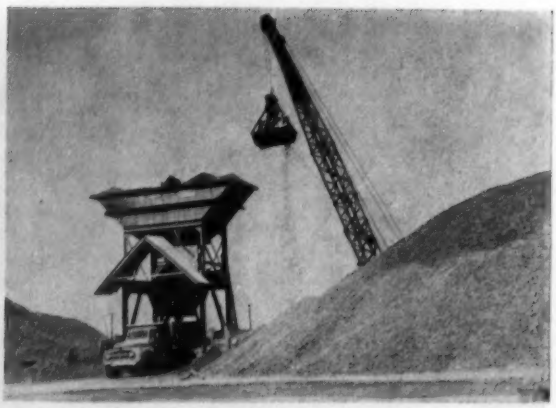
The big advantage of the slag concrete is in sawing of dummy joints. Slag can be sawed by an inexpensive Cardinal Fiberglas blade that cuts across a 25-ft slab in about 3½ min. The cut is ¼ in. wide and 3 in. deep. A Fiberglas blade lasts for only about 175 ft, but the cost per ft is considerably less than with diamond blades.

Most of the concrete on the job is going into 1,000-ft end sections on the runway. It is placed 16 in. thick in 25-ft unreinforced slabs.

A fleet of three-batch trucks is loaded with two sizes of slag, one size sand, and cement. Blaw-Knox double-gate batch bins speed load-

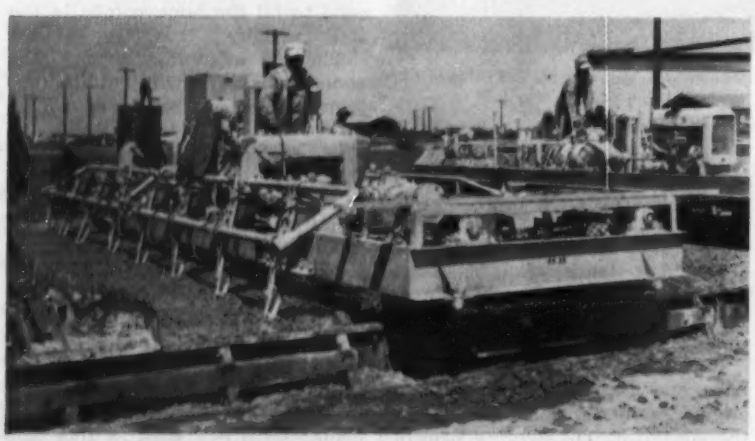
Slag in Concrete . . .

TRAILER LOAD of coarse slag for concrete aggregate is dumped at stockpile in batching area. Stockpiles of dry slag are wetted to reduce the amount of mixing water required at paver.



BATCH TRUCK is filled by two-gate Blaw-Knox batcher as Northwest clamshell charges two-compartment bin. Because slag is deficient in fines, trucks stop at second bin for sand.

TWO DUAL-DRUM PAVERS, both Koehring Twinbatchers, work side by side between poured lanes. Concrete is placed 16 in. thick in 25-ft lanes. Water for mix is pumped from tank trailers pulled alongside. Blaw-Knox spreader follows pavers.



VIBRATOR MACHINE follows behind spreader consolidating dry slag mix. Eight Stow vibrators shown here were later increased to 12. LeRoi electric set powers vibrators.

ing. Two Koehring 34-E dual-drum pavers work inside the forms. The finishing spread consists of a Blaw-Knox spreader, a job-made rig mounting 12 Stow vibrators, a Blaw-Knox finisher, a Koehring bull float, and a Heltzel curing machine. Production averages about 2,200 cu yd in a 10-hr day.

Grading

Before any paving started, Tecon spent months excavating more than 700,000 cu yd of sand and hauling in 160,000 cu yd of select gravel. With eight Euclid, six Allis-Chalmers, and two Caterpillar 15-yd scrapers, the contractor moved about 10,000 cu yd per 9-hr

SCRAPER BOWL quickly fills with sand as Allis-Chalmers HD20 tractor pushes from behind. With sixteen 15-yd scrapers on job, Tecon moved about 10,000 yd per 9-hr day. Average haul was about 4,000 ft. Job called for more than 700,000 cu yd of excavation. Fill was spread in 6-in. lifts and compacted to 100% density with Ferguson 50-ton rubber-tired rollers.

FAST-MOVING EUCLID SCRAPER spreads sands over fill. Big 15.5-yd units have 300-hp engines and Torqmatic drives. Tires are 29:50x25 for extra traction in sandy material. Tecon had eight of the big Euclids on the job. They worked through much of the winter.

day. Average haul was about 4,000 ft.

Compaction requirements were 100% density for the top 2 ft and 95% below. This was achieved by rolling with 50-ton Ferguson compactors at optimum moisture content.

J. D. Metcalfe is project manager for Tecon Corp. A. Marolda is construction coordinator and Lt. Col. J. C. Lee, Jr. is resident engineer for the Philadelphia District of the Corps of Engineers, U. S. Army.

When completed, McGuire Air Force Base will be a personnel depot for the Military Air Transport Service, which is now at Westover Air Force Base, Mass.

HEAPED 18-YD LOAD of sandy material flows out of Allis-Chalmers TS300 scraper bowl as big unit highballs over taxiway fill. Heavy rigs help achieve high compaction.

65-Ton Crane Dragged From Chicago River

LOOKING LITTLE THE WORSE FOR WEAR, a Bucyrus-Erie 51B crane owned by the States Improvement Co. is hauled up a steep bank of the Chicago River. The operator jumped to safety before the crane settled in 21 ft of water after toppling from the sloping bank.

THERE IS NO STANDARD operating procedure to follow when you're trying to retrieve a 65-ton crane from 21 ft of river water. States Improvement Co. found that out after their Bucyrus-Erie 51B toppled into the Chicago River as the operator jumped safely to the bank where it had been working on a 15-deg slope.

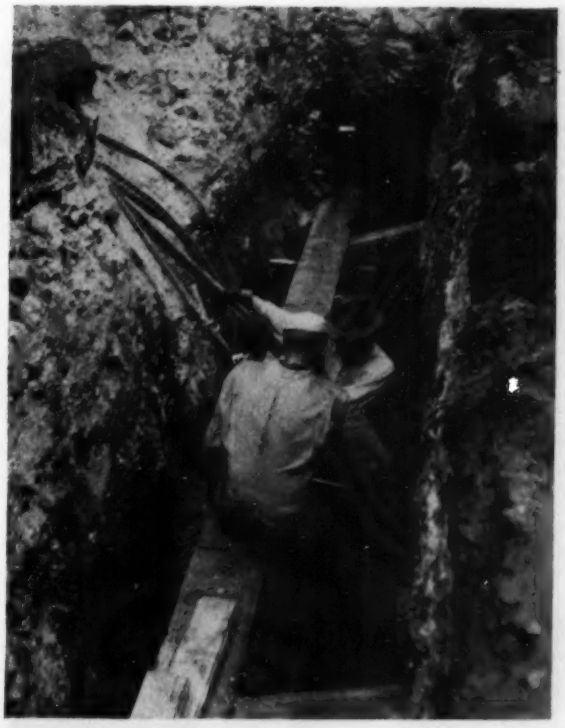
To salvage the valuable crane, the contractor considered using floating equipment, but investigation disclosed it would be expensive and probably result in additional damage. Finally it was decided to try and pull it out from land.

About 60 ft from the river edge, three 23-ft long, 18-in. H-beams were placed in each of two 12-ft deep pits. Two ⅞-in. cables were fastened to these deadman beams.

A diver then hitched the lines to both sides of the front end of the completely submerged crane, and also removed half its boom. The lines were reeved through two snatch blocks, one with an eight-part line hookup and the other with a nine-part line. Lateral tugging power was supplied from the cable drum of an Allis-Chalmers HD-21 tractor and a 50-ton Gar

3 LATERAL TUGGING POWER was supplied by 50-ton Gar Wood winch on a White truck chained to an Allis-Chalmers HD-5. Cable is hooked in with nine-part line through snatch blocks.

4 CABLE DRUM of Allis-Chalmers HD-21 pulls other line from submerged crane. Both lines had to be reeved carefully so that crane's tracks were kept in alignment to climb river bank.



1 TWO 7/8-IN. CABLES are looped around 23-ft long H-beams placed in 12-ft deep pits dug about 60 ft from river edge. Salvage from land proved cheaper than using floating equipment.

2 DIVER GOES DOWN to hitch lines to both sides of the completely submerged crane's front end. He also removed half of its boom. Lines were then reeved through snatch blocks.

Wood winch on a White truck. The truck was chained to an Allis-Chalmers HD-5 for added anchorage. A sister Bucyrus-Erie 51B and an Osgood crane attached their lines to the boom and to the boom hoist frame of the sunken crane to supply vertical lift.

The two cranes, the HD-21 and the truck winch were then worked, at times separately and at other times in unison, so that the tracks of the sunken crane were kept in alignment to crawl up the steep river bank.

Finally, after six tedious hours, the Bucyrus-Erie was hauled to land, without additional damage.

5 SISTER BUCYRUS-ERIE 51B, left, and an Osgood crane attach their leads to boom and boom-hoist frame to supply vertical lift. Powerful team starts to pull crane from river bottom.

6 AFTER WORKING separately and in unison for six tedious hours, vertical pull of cranes and lateral pull of winches retrieve the Bucyrus-Erie 51B without additional damage.

CAT-HEAD BEAM for jumping creeper traveler is placed on steel tier of suspension bridge tower. Temporary spacer strut 87 ft long is fixed across top of tower to check inward deflection of legs when permanent strut sections are cantilevered out.

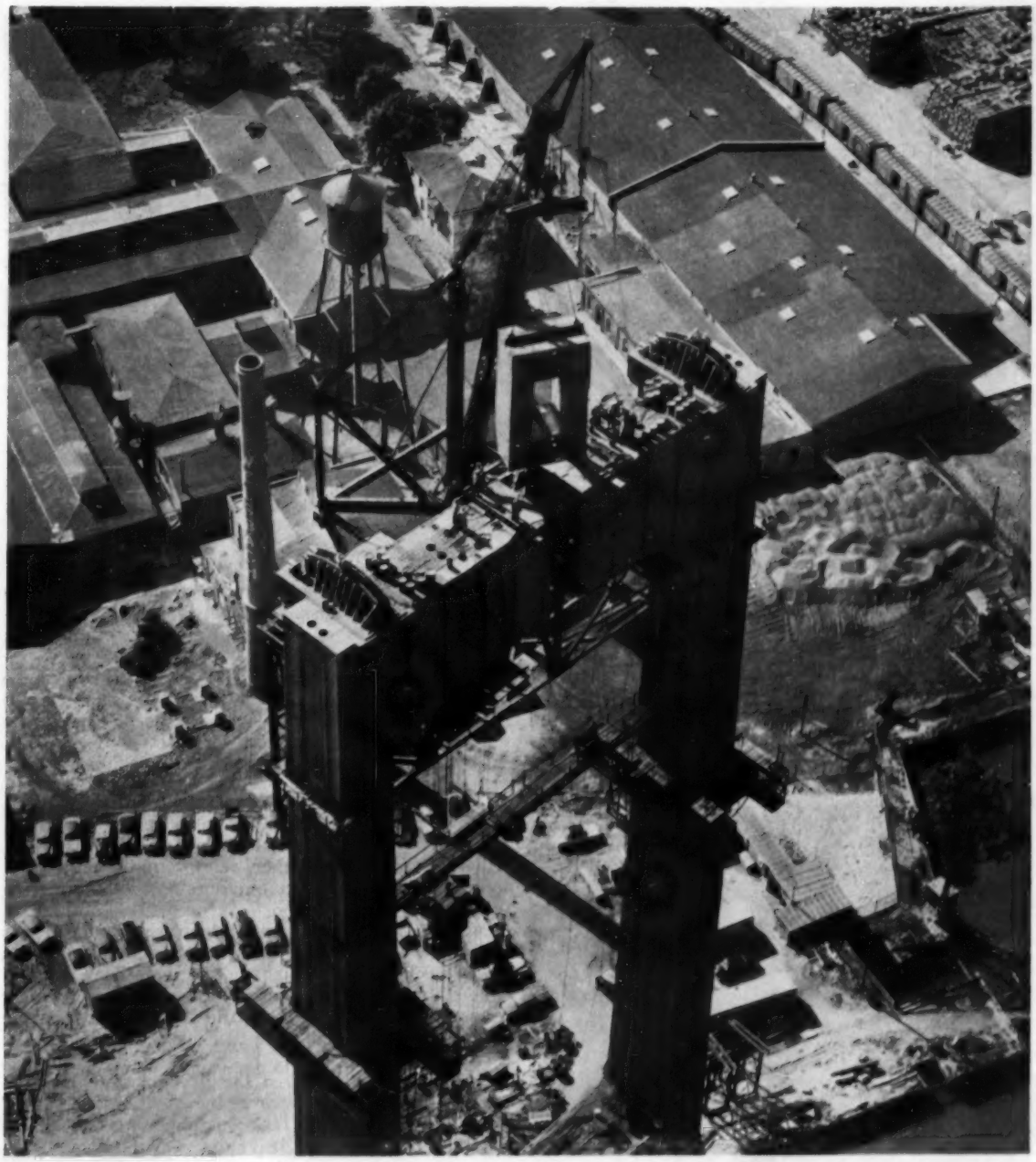
CENTER STRUT SECTION is hoisted by traveler to top of tower. Spacer strut was removed after jacking frame was put into action on top of permanent upper strut. Note how cable-guided elevator carries men to several levels on tower.

JACKING FRAME placed around opening for center section of upper strut pushes legs apart to provide 1/2 in. clearance. Two Watson-Stillman jacks are set 16 ft apart on jacking beam.

Spacer Strut Checks Leaning of Tower Legs

A TEMPORARY STEEL SPACER STRUT 87 ft long is being used by Bethlehem Steel Co. to counter inward deflection of high suspension bridge towers under construction on each side of the Delaware River at Philadelphia. (CM&E, March 1955, p 70)

Fastened at the tower's center line just below the top tier, the lattice-type box member resists leaning of the high legs, as heavy sections of a permanent upper strut are cantilevered out from each side. When all but the center section of the upper strut are placed, a jacking frame is set up around the top of the gap. As soon as the jacks take over, the spacer strut is removed, the permanent strut section is set in place by



CREEPER TRAVELER places 35-ton center strut section, as jacking frame widens opening to proper width. Note 42-ton cast-steel saddles which will support huge suspension cables. Also note protected hanging scaffolds on each leg for field riveting crews.

a creeper traveler, and the jacks are released. The method not only prevents inward deflection of the tower legs, but also counters excessive side pressure on the creeper traveler.

Because of the huge weight of the towers, Bethlehem engineers designed the spacer to resist a thrust of 100 tons. Without the spacer, the permanent strut sections would have pulled the 370-ft high tower legs a total of 4 in. toward each other. Fabricated by lacing four angles together, the strut is supported horizontally by brackets fastened to the unriveted vertical splices of the legs. It is 4 ft high, 7 ft wide and weighs 7½ tons.

The 5-ton jacking frame consists of two jacking columns supported by two jacking beams. Two Watson-Stillman jacks set 16 ft apart along one jacking beam push the tower legs apart, providing a clearance of ½ in. for placing the center strut section in the opening.

The $90,000,000 suspension bridge is being built by the Delaware River Port Authority. The steelwork is being erected by Bethlehem's Eastern Erection District under G. P. Bullard, manager of erection, with M. A. Matlock, his assistant in direct charge. At the site, V. Assetto is resident engineer and Oscar Brunn is superintendent.

Simple Form-Handling Is Key to Fast Deck Paving

DECK FORMS are laid quickly. They consist of 2x8-ft plywood panels on 3x6-in. ribs spaced 19 in. apart. Notched rib ends are supported by simple wire hangers.

SIMPLE FORMS, efficient material handling, and a clever concrete-additive trick, are pushing deck paving way ahead of schedule on a high bridge across Newark Bay in New Jersey. Cayuga Foundation Co. of New York is working both sides of the 6-lane, 2-mi bridge, averaging about 600 yd a week on each side.

Fast production is the result of good planning on all phases of the job. Forms, for instance, are designed for easy placing and stripping. They consist of ⅝-in. plywood on 3x6 ribs spaced 19 in. apart. Plywood is handled mostly in 2x8-ft sheets. These narrow sheets require no cutting, and are easier to strip than wider ones. Gaps between sheets are covered with strips of precut plywood or lightweight metal.

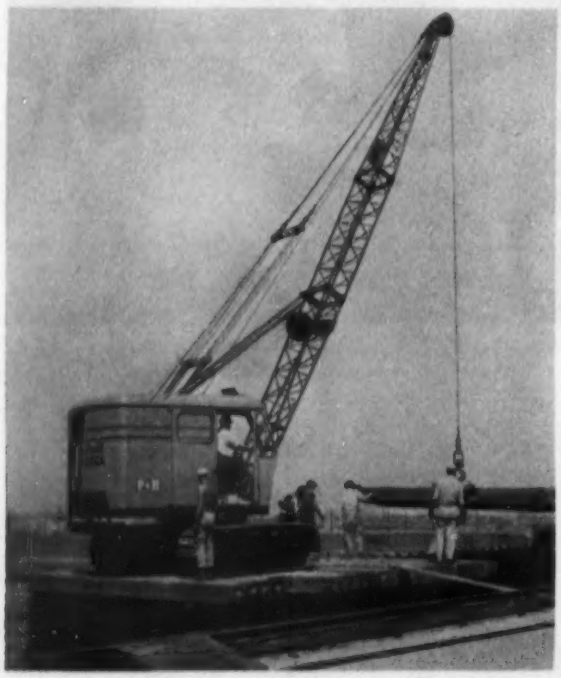
Ribs, notched at the ends, fit under the top flange of the stringers and are supported by simple wire hangers. Notches are made 1½ in. deep to form the haunch above each stringer. The deck is 8½ in. thick at the haunches and 7 in. at all other points.

Crane on Deck

Form placing is fast, but it takes some tricky handling to get the materials where they are needed. Huge quantities of lumber, reinforcing steel, and accessories have to keep moving to the form-laying crews.

On the low-level approach spans, all material was hoisted over the deck by a long-boom crane. But soon the increasing height of the wide deck made it impossible for a crane on the ground to reach in far enough to stack materials. And trucks could not ride on any part of the deck until it had cured more than a week.

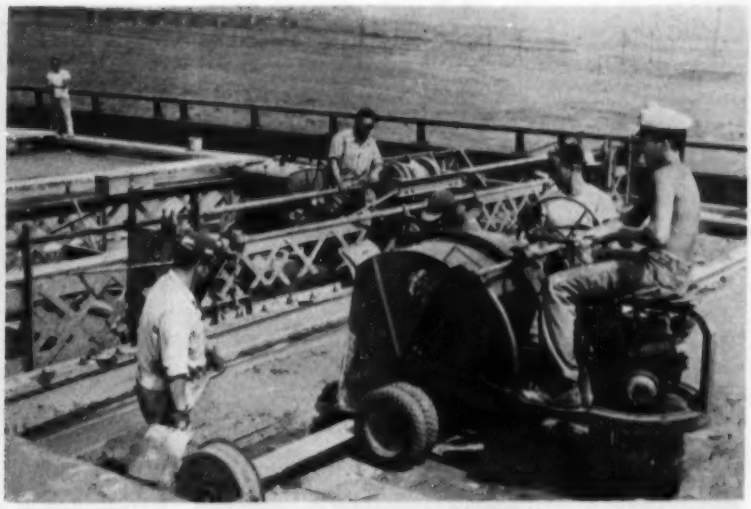
Cayuga quickly solved the problem by placing a small P&H 255A crawler crane right up on top of the steel stringers. It rests on timber mats, which it leapfrogs ahead when traveling. On the ground be-



SMALL CRAWLER CRANE riding on steel stringers hoists all materials up to deck. Cranes on ground could not reach in far enough. P&H 255A swings timber mats in front when traveling.

LIFTING FORKS mounted on bucket equip fast-moving Hough Payloader for hauling form materials to points under deck crane. Bundles of reinforcing steel are dragged with raised bucket.

OVERSIZE BUCKET on Whiteman powered buggy dumps concrete and returns for refill.



THREE-LANE DECK PAVING moves forward as Whiteman powered buggies dump from movable platform into forms. Heltzel finishing machine makes three passes for good finish.

low, a Hough Payloader, with lifting forks mounted on the bucket, hauls materials from the yard to a position below the crane.

Operating about a third of the way in from the edge of the structure, the crane can hoist materials up through the stringers or along the outside of the bridge. It can reach across the center mall into the opposite lane and supply form-laying crews directly, or it can swing to the rear and stack materials on the stringers behind it. When the paving reaches the river crossing next month, the crane will hoist supplies from barges.

On the long beam-span approaches, a big problem involved getting satisfactory supports for the rails on which the finishing machine rides. They had to be strong and accurate, because exact elevation of rails is a major factor in getting a smooth deck surface. Cayuga did the job by welding 3-in. threaded pipe-sections to the top flanges of stringers in an upright position. Over the threads, workmen screw on special metal caps that are fitted with bolts and flaps to anchor the rails. Setting the cap at the exact elevation is simple, because a half-turn provides a 1/16-in. adjustment. When the finishing machine moves ahead, bolts are loosened, flaps are turned off the flange, and the rail is moved up. The caps are then removed and used again. Pipe-sections are left behind and grouted inside the mall or curb.

SUPPORTS for finishing machine rail consist of 3-in. pipe-sections welded to top flange of stringers. Thread on pipe allows 1/16-in. adjustment of rail-anchoring cap.

Paving

Paving follows the conventional alternate-lane method, using two separate finishing spreads. The distance between the advancing spearheads of the two spreads varies from a few hundred to about 1,000 ft.

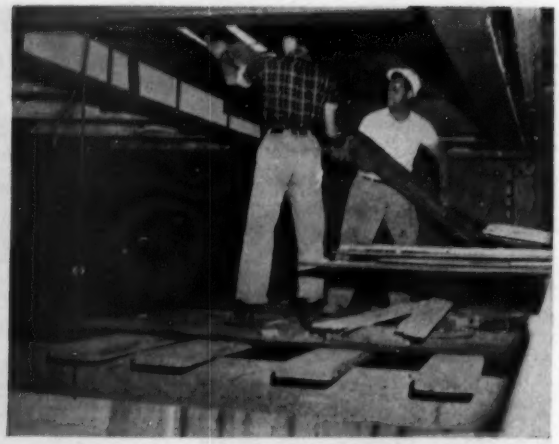
Ready-mix concrete trucks ride on the deck as far as they are permitted, and then dump into a fleet of Whiteman powered buggies. The ½-yd buggies speed to the finishing spread, where they ascend a small ramp attached to a movable unloading platform. They quickly dump from the trailing edge of the platform, and return for another load. The platform rides on the same rails as the finishing machine, and is propelled by a hand winch connected to a cable anchored several hundred feet forward.

Behind the platform, a Heltzel single-screed finishing machine makes three passes over the 38-ft wide deck to assure a smooth finish. Longitudinal hand floating is done next, followed by hand luting. A broom finish is then applied and the concrete sprayed with Spraycure.

One of the main reasons for the contractor's fast production is his ability to pour in a continuous operation, instead of jumping back and forth, as is usually required when paving over continuous beam spans. Original specifications called for the paving of alternate blocks to prevent abnormal deflections from cracking the newly set concrete.

But pouring alternate blocks is inefficient. So

HANGING SCAFFOLD on which workmen stand while stripping forms is moved into next bay. Operator takes up slack in hand winch as workmen leapfrog hangers ahead. When scaffold is moved, steel rails in floor ride in rollers attached to base of hangers.



OUTRIGGER PLATFORM on hanging scaffold extends under center mall to permit stripping crew to hand forms up through holes to workmen on deck. Outrigger joists are attached to main scaffold joists with temporary dowels. Platform is dismantled for each move.

HERE'S ONE WAY to keep cool. Worker sports well-ventilated Bermuda-length shorts while handling stripped form pieces. Crew below works on outrigger of hanging scaffold. With one hanging scaffold, a crew can strip four 40-ft bays a day.

Cayuga and the consulting engineers on the job worked up a clever solution. They add Sika's Plastiment retarder to all mix placed 18 ft on each side of the support. Using it at the rate of ¼ to ½ lb per sack of cement, the contractor keeps the concrete at the supports in a liquid state until the loads on each side are equalized. In this way, the finishing spreads never have to return to pave left-out blocks.

On the big spans near the center of the bridge, retarder is not required because the girders are simply supported. But because of the improved strength, workability, and ease of finishing experienced with Plastiment on the beam spans, Cayuga uses it practically all the time, especially in hot weather.

Stripping

Although paving is hitting a fast pace on the Newark job, form stripping is keeping right up with it. Under the beam spans, forms are stripped, lowered to the ground, moved ahead to the deck-riding crane, and hoisted up to be used again. On the girder spans, however, the stripped forms from one lane can be handed up through holes in the steel mall to crews on the opposite lane.

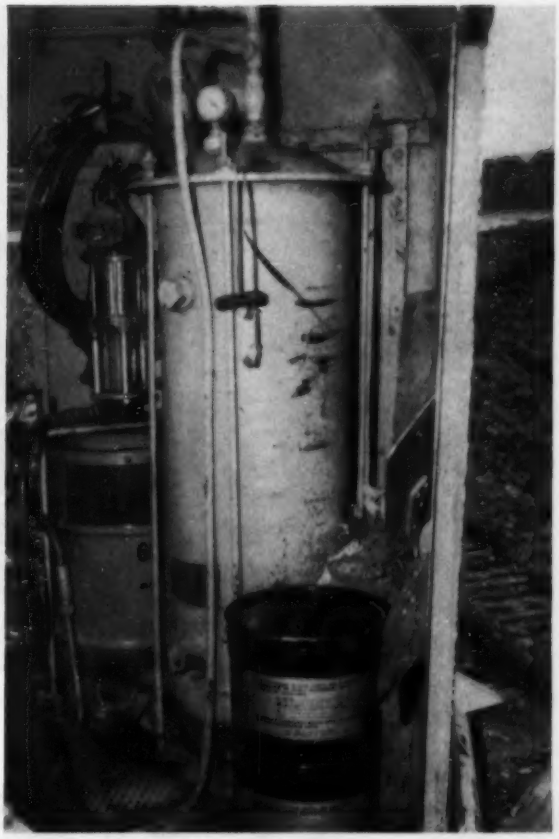
The stripping scaffold is a handling platform which is winched from bay to bay in the small opening between piers and cross-girders. The wood and steel floor of the scaffold is suspended from eight hangers attached to the bottom flange of the stringers. Two steel rails in the platform ride in rollers attached to the base of each rod.

When a bay is completely stripped and the lumber removed, the platform is slowly winched forward on the rollers as the hanger rods are leapfrogged ahead, two at a time. As soon as the scaffold is secured in the next bay, 2x8 joists are set on brackets, welded to the middle of the hanger rods. Planks are then spread over the joists to form a working area for the stripping crew. Workmen simply snip the wire hangers that support the ribs and the form sections come down with a minimum of prying.

To hand the pieces up to a crew on top of the deck, workmen stand on an outrigger scaffold which projects from the main scaffold. The outrigger has to be dismantled for each move. Crews strip four 40-ft bays a day.

Sid Chauivard is superintendent for Cayuga Foundation Co. L. Brown is project engineer and L. Ripa is assistant project engineer for Howard, Needles, Tammen and Bergendoff, consultants, H. Goldberger is construction engineer for the New Jersey Turnpike Authority, bridge owner.

AIR-POWERED GUN quickly pumps grease into track rollers of Lima shovel. Hand methods are not only much slower but also get less penetration. High-pressure gun operates at 40 to 1 air ratio.



HIGH-PRESSURE GREASING UNIT consists of 115-lb grease drum, reel of hose, and gun. Air is supplied by tapping control system. Unit cuts hand-greasing time by a third.

Air-Powered Gun Quickly Greases Shovel

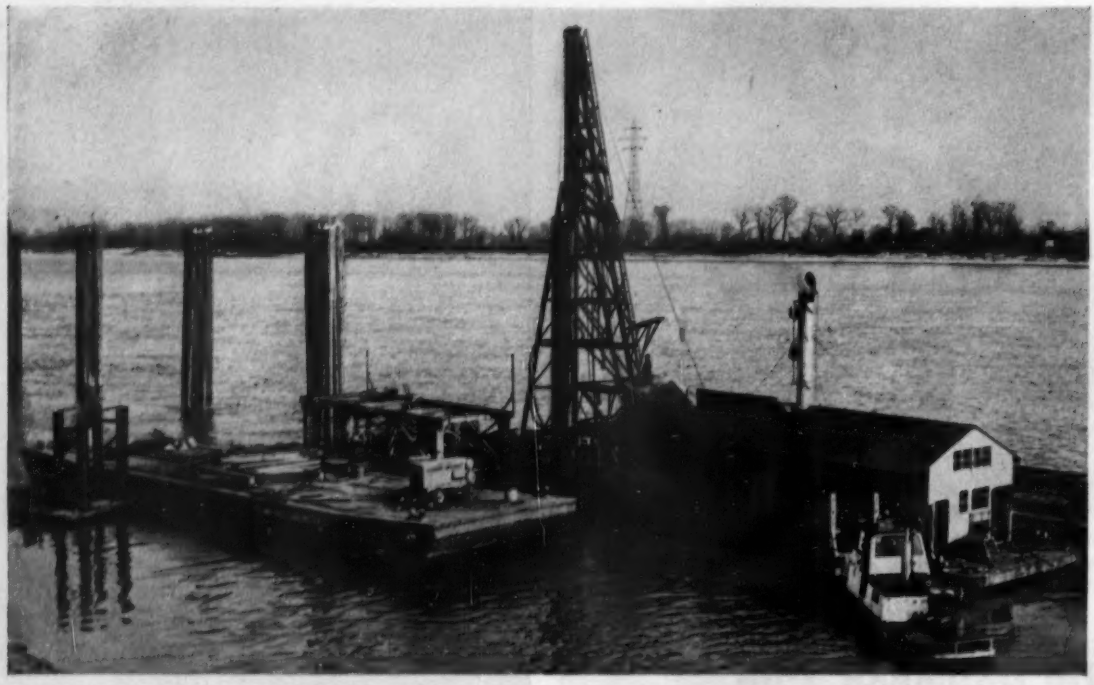
BY TAPPING the main air-feed line of a shovel's control system, Union Building and Construction Co., Passaic, N.J., has developed an air-powered unit that greases a big Lima 1201 in a third of the normal time.

Mounted in the cab, the complete unit consists only of a 115-lb grease drum, a 35-ft reel of hose, and a high-pressure Lincoln gun operating at a 40:1 air ratio. Receiver tank pressure is 125 psi.

Except for the hoist drums which require low-pressure service, the gun covers the entire shovel. The hose is quickly coupled to either one of two grease lines. One line runs from the grease drum to a front corner of the shovel, and the other runs to the opposite rear corner. Non-hazardous areas of the rig are greased while the shovel is operating; the rest are done during the 30-min noon break.

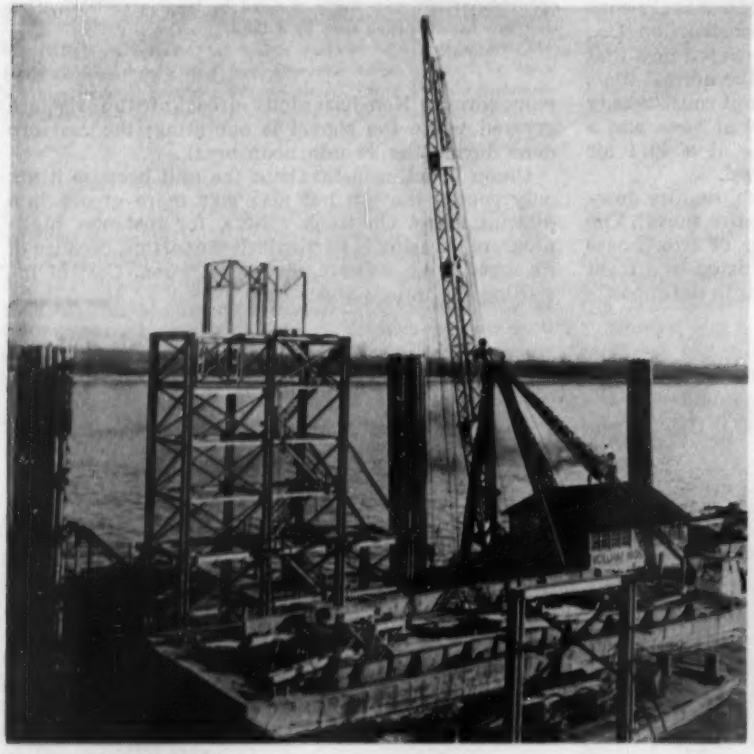
Union is enthusiastic about the unit because it not only speeds the job but also gets more grease into difficult areas. On track rollers, for instance, high-pressure greasing is particularly important because of its speed, high volume, and penetration. Cost of installing the unit is about $500.

BIG LIMA SHOVELS with 3½-yd buckets load fleet of Euclid wagons at Stewart Air Force Base, N. Y. Non-hazardous areas of shovel are serviced while rig operates; other areas are done at noon. Gun cuts greasing time to a minimum.



Equipped with special 80-ft leads and single-acting steam hammer...

Floating Rig Drives High Pile Clusters



FLOATING DERRICK with 25-ton capacity erects steel frame for liquid sulfur unloading dock. All members are connected with high-strength bolts. High pile clusters moor barges.

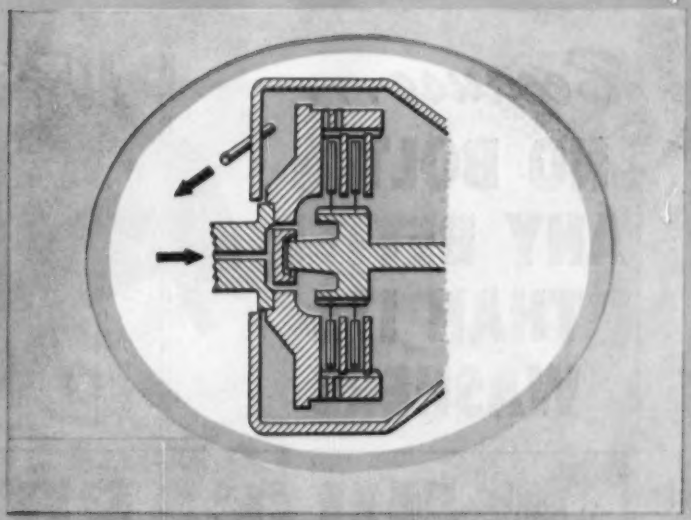
A FLOATING PILE DRIVER with 80-ft leads drove ten high mooring clusters at a new sulfur unloading dock in St. Louis. The big rig drove 95-ft fir piles 30 ft deep, in clusters of 19 or 30. They were bound together with ¾-in. galvanized steel cable at four points.

Built by Vollmar Bros. Construction Co. of St. Louis, the new dock will unload hot liquid sulfur from special thermos-bottle-type barges. Both the steel dock and the mooring clusters are designed to function whether the river is at flood stage or the low-water mark. The steel dock rests on 14-in. bearing piles driven to 40-ft penetration by a Vulcan No. 1 single-acting hammer. On top of the piles, a prefabricated sill section was welded. Structural steel members, handled by American stiffleg derrick boat (see cover photo), were then erected on top with high tensile bolts. Pneumatic impact wrenches tightened the bolts, and torque wrenches checked the tension.

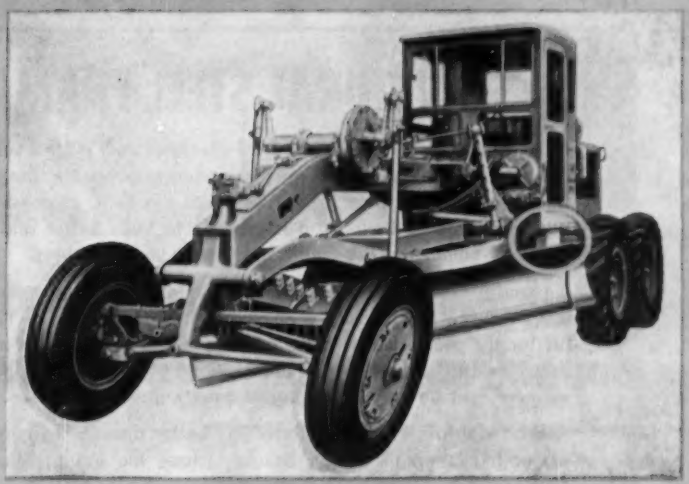
The dock has six working platforms at 9-ft intermediate levels, all connected by stairways. This permits unloading crews to get to the barges regardless of weather

CATERPILLAR ANNOUNCES ANOTHER "FIRST":

NEW OIL CLUTCH for the NO. 12 MOTOR GRADER



Arrows show path of oil through housing with clutch disengaged. Facings remain cool and bathed in oil, which is carried to outlet at top by flywheel ring gear. The two steel clutch discs and clutch brake are faced with pressure-processed cork, which gives an excellent coefficiency of friction and long wear.



The new oil clutch for the No. 12 Motor Grader gives you the same reliability and improved performance as the thoroughly job-proved oil clutch in Caterpillar track-type Tractors. Rugged and reliable, it uses oil from the engine lubrication system. Here are some of the things the new oil clutch for the CAT* No. 12 can mean to *you:*

LONGER WORK LIFE—In actual on-the-job tests, clutch facings wear less than the thickness of a human hair in one thousand hours' operation! Thick clutch facings mean that work life is extended thousands of hours before discs need be replaced. And constant "oil bath" lubrication reduces wear on all moving parts.

LESS MAINTENANCE—Adjustment every 1500 hours is not unusual, after initial "break in." This is equivalent to nearly nine months without adjustment on road maintenance work! No external lubrication is needed: internal oil system lubricates pilot and throwout bearings.

GREATER EFFICIENCY—The clutch is constantly cooled, never exceeding normal engine oil temperature. This practically eliminates clutch fade, greatly reduces slippage due to overheating, and means that the clutch retains "like new" operation for thousands of hours.

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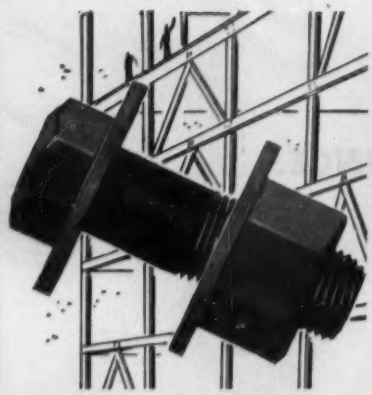

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And because no bolt assembly is any better than its washers, consistent high-strength bolting should include the use of MIL-CARB Carburized Washers.

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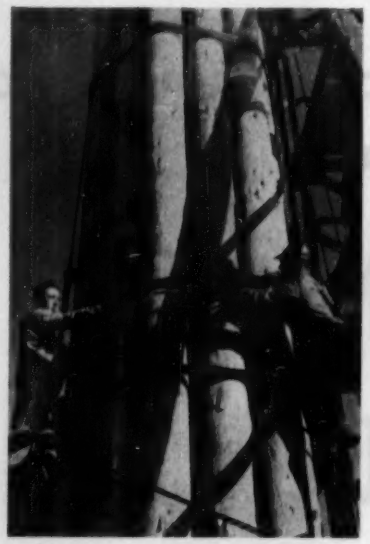

STEEL CABLES are wrapped around high mooring cluster at four points. Cluster is composed of 30 fir piles 95 ft long.

HIGH-STRENGTH BOLT tension is checked with torque wrench. Bolts for steel dock are tightened with pneumatic impact wrenches.

or the stage of the river. And prompt unloading in all weathers is important because of the unusually high upkeep on the towboat and barges. The standby cost is about $100 per hr.

The 1,100-mi trip from Port Sulfur, La. to St. Louis takes about nine days. The liquid sulfur, which is shipped at a temperature of about 300 deg., is pumped at the dock through steam-jacketed pipes to insulated storage tanks. From the tanks the liquid is pumped directly to the St. Louis plant of National Lead Co.'s Titanium Division.

Cleveland "80" uses long reach, accurate pipe handling, teams up with trencher on tough 10-mile water line job

KIEFFER BROTHERS, contractors of Mount Carmel, Ill., matched their Cleveland Model 140 trencher and Model 80 side crane against 10 miles of really rough work on a 10-inch cast iron water main job in Loogootee, Ind., this winter. They report their decision paid off well in both time and money saved.

Cutting the 10-mile line through hilly terrain alongside a curving road, Kieffers' trencher maintained a fast, dependable pace overcoming frost and plenty of Indiana sandstone. Despite the tough digging in close quarters, the "140" left a clean trench ready for pipelaying.

Kieffers' "80" kept the pipelaying operation up close, usually only a couple of joints behind the trencher. The one-man-operated "80" picked up the pipe strung along the opposite side of the road, turned on its maneuverable full crawlers and accurately positioned the pipe for fast, easy installation. The Model 80's large, easy-acting hydraulic clutches and smooth handling brakes and boom hoist which placed and held pipe exactly to required positions also are responsible for its outstanding speed and accuracy when employed as a backfiller.

Cleveland's perfect operator visibility and well placed foot and hand controls, clearly shown in these photos, keep operators at top efficiency for top production all day long.

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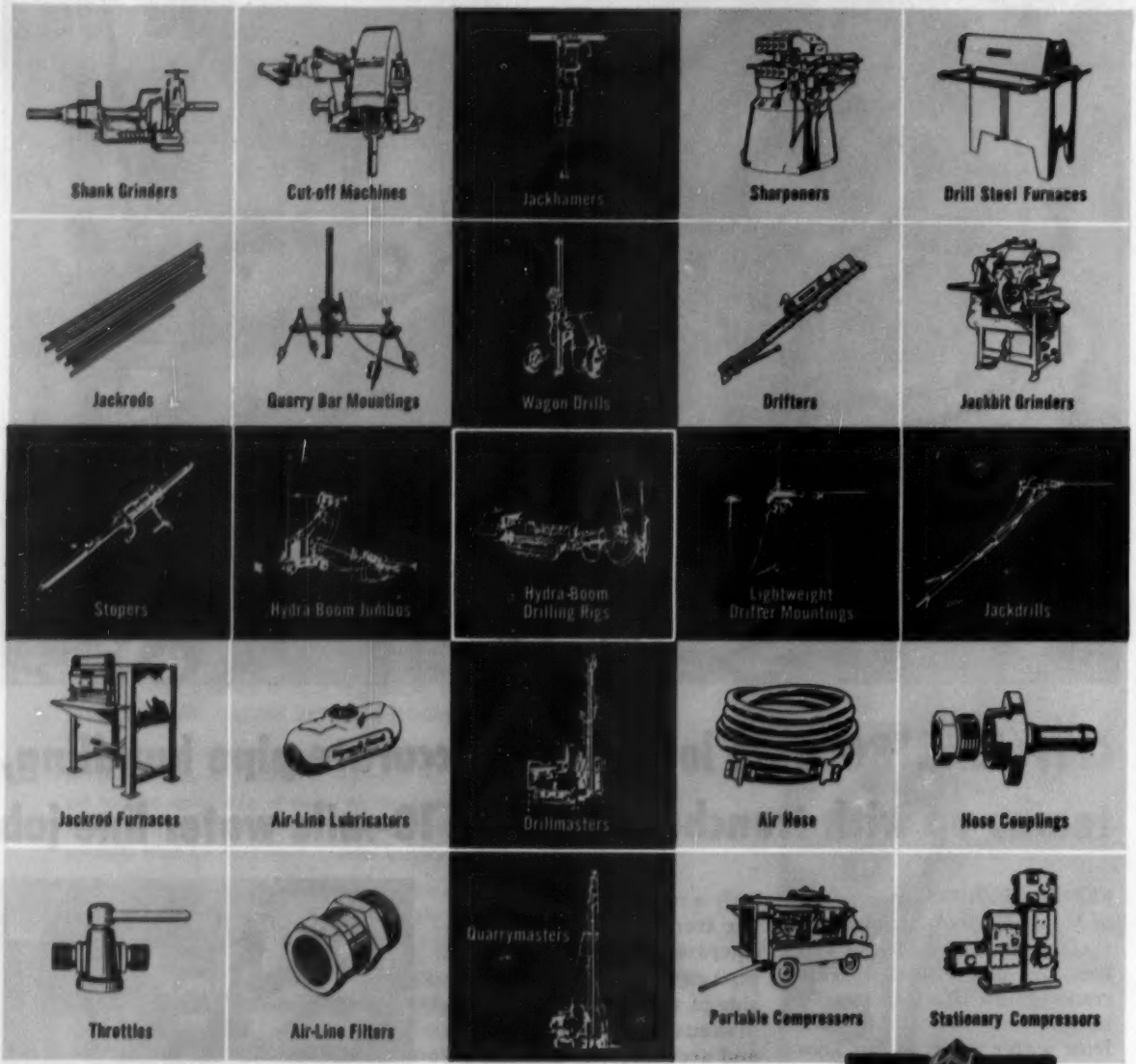

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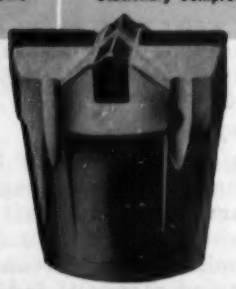

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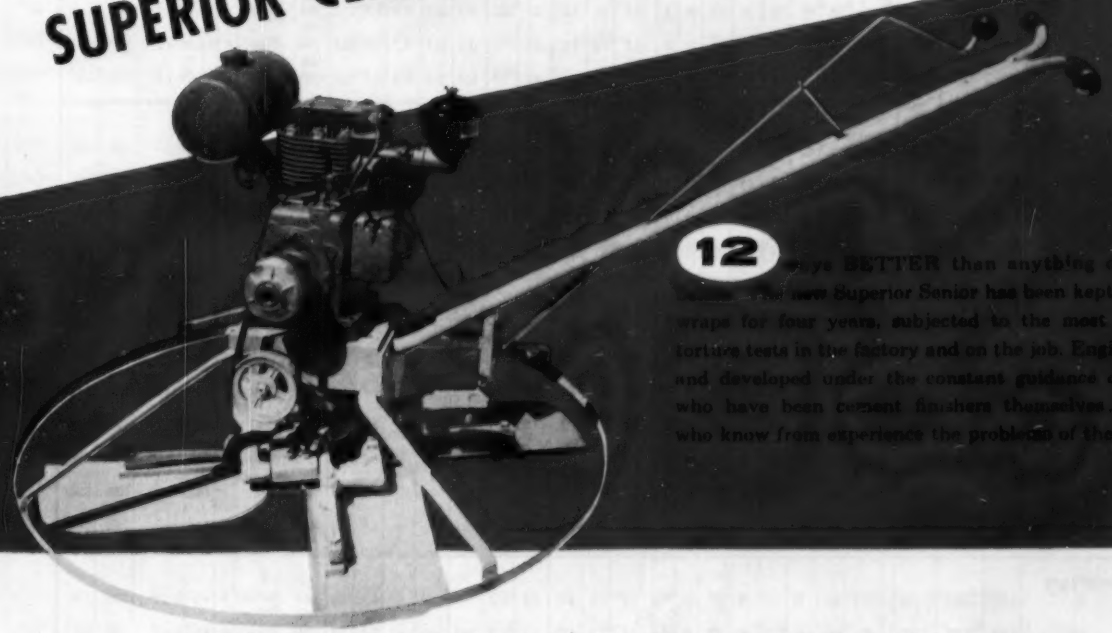

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MOTOR GRADERS-1955

Specs for Your Files...

	MOTOR GRADER Make and Model	WEIGHT: Front Wheels	WEIGHT: Rear Wheels	WEIGHT: Total	HP: Belt hp	DIMENSIONS (IN.): Length	DIMENSIONS (IN.): Width	DIMENSIONS (IN.): Wheel Base, Min. With Cab	DIMENSIONS (IN.): Wheel Base, Min. Less Cab	DIMENSIONS (IN.): Tread, Front	DIMENSIONS (IN.): Tread, Rear	TRAVEL SPEEDS: 1st	2nd	3rd	4th	5th	6th	7th	8th	Drawbar, Low	Drawbar, High	ENGINE: Make and Model	Type Fuel	Cycle	No. of Cylinders; Bore, Stroke	Rated RPM	Starting Method
(A)	ADAMS																					Cum.			6		
1	660	7,000	20,720	27,720	140	316	94	128	96	227	79	80	2.3	3.3	4.7	6.7	10.3	14.6	16.7	26.0	1.9	13.7	600	Diesel	4	4 7/8x6	1800	Elec.
2	550	6,345	17,580	23,925	115	306	93	126	92	227	78	79	2.2	3.2	4.6	6.5	10.0	14.1	16.1	25.2	1.8	13.2	Int. 525	Diesel	4	6 4 1/2x5 1/2	1800	Elec. Gas
3	440	6,100	16,080	22,180	100	304	93	126	92	227	79	79	2.2	3.2	4.6	6.5	10.0	14.1	16.1	25.2	1.8	13.2	Int. 14A	Diesel	4	4 4 3/4x6 1/2	1800	Elec. Gas
4	330	6,100	14,400	20,500	75	303	92	125	91	227	79	79	2.1	2.9	4.2	6.0	9.2	13.0	15.0	23.3	1.7	12.2	Int. 350	Diesel	4	4 4 1/2x5 1/2	1800	Elec. Gas
(B)	ALLIS-CHALMERS																					GM			4		
5	AD-40	6,440	16,540	23,000	104	307	92	125	93	225	79	78	2.7	4.0	5.8	8.7	12.9	20.4	–	–	3.2	7.0	4-71	Diesel	2	4 1/4x3	1600	Elec.
6	AD-30	6,375	16,325	22,700	78	307	92	125	93	225	79	78	2.7	4.0	5.8	8.7	12.9	20.4	–	–	3.2	7.0	GM 3-71	Diesel	2	3 4 1/4x5	1600	Elec.
7	BD-3	4,940	14,280	19,220	78	286	90	116	91	214	79	76	2.4	3.6	5.3	7.9	11.8	18.5	–	–	2.9	6.3	GM 3-71	Diesel	2	3 4 1/4x5	1600	Elec.
8	D	2,700	6,100	8,800	50	220	72	90 106	74	167	60	64	2.7	4.9	11.8	25.6	–	–	–	–	3.3	–	AC 226	Gas	4	4 4x4 1/2	1400	Elec.
(C)	AUSTIN-WESTERN																					Int.			6		
9	99-IHC	8,480	13,270	21,850	115	291	94	121	104	224	79	79	2.2	3.6	5.3	7.4	12.0	19.3	–	–	2.3	7.6	525	Diesel	4	4 1/2x5 1/2	1800	Elec.
10	99-GMC	8,480	12,870	21,350	108	291	94	121	104	224	79	79	2.2	3.6	5.3	7.4	12.0	19.3	–	–	2.3	7.6	GM 3-71	Diesel	2	4 4 1/4x5	1800	Elec.
11	99H-IHC	8,760	12,540	21,300	100	291	94	121	104	224	79	79	2.0	3.2	4.7	6.6	10.7	17.2	–	–	2.0	6.7	Int. 14-A	Diesel	4	4 4 3/4x6 1/2	1800	Elec.
12	88-Gas	7,990	11,062	18,142	79	340	96	117	100	228	84	84	2.2	3.5	5.2	7.5	12.2	19.5	–	–	2.2	7.6	Buda K-393	Gas	4	6 4 3/16x4 3/4	1800	Elec.
13	88-Diesel	7,115	11,527	18,642	82	340	96	117	100	228	84	84	2.2	3.5	5.2	7.5	12.2	19.5	–	–	2.2	7.6	GM 3-71	Diesel	2	3 4 1/4x5	1800	Elec.
14	88H-Gas	7,090	8,970	16,060	79	282	93	120	104	222	80	80	1.9	3.0	4.3	6.4	10.4	16.6	–	–	1.9	6.5	Buda K-393	Gas	4	6 4 3/16x4 3/4	1800	Elec.
15	88H-Diesel	7,115	9,445	16,560	82	282	93	120	104	222	80	80	1.9	3.0	4.3	6.4	10.4	16.6	–	–	1.9	6.5	GM 3-71	Diesel	2	3 4 1/4x5	1800	Elec.
(D)	CATERPILLAR																					Cat			6		
16	12	6,380	16,030	22,410	115	302	93	118	88	225	80	79	2.3	3.6	5.5	8.5	12.0	19.3	–	–	4.0	6.3	318	Diesel	4	4 1/2x5 1/2	1800	Gas
17	112	5,875	14,005	19,880	75	299	94	117	88	225	79	78	2.1	3.0	4.0	5.6	11.2	16.0	–	–	2.8	4.0	Cat 315	Diesel	4	4 4 1/2x5 1/2	1800	Gas
18	212	3,655	9,880	13,535	50	263	82	115	84	198	70	68	2.0	3.1	4.9	11.9	–	–	–	–	2.8	–	Cat 311	Diesel	4	4 4x5	1800	Gas
(E)	GALION																					GM			4		
19	118	6,900	16,600	23,500	125	308	92	124	92	227	80	78	2.5	4.2	6.4	8.8	14.8	22.6	–	–	2.9	10.5	4-71	Diesel	2	4 1/4x5	1800	Elec.
20	104	6,590	15,645	22,235	93	305	91	123	91	227	80	78	2.0	3.3	5.2	7.1	11.8	20.1	–	–	2.4	8.4	GM 3-71	Diesel	2	3 4 1/4x5	1800	Elec.
21	450	6,290	14,865	21,085	75	305	91	123	91	227	80	78	2.0	3.3	5.2	7.1	11.8	20.1	–	–	2.4	8.4	Int. 350	Diesel	4	4 4 1/2x5 1/2	1800	Elec.
22	303	3,575	9,870	13,445	55	276	80	116	85	206	69	69	2.6	3.6	4.2	5.6	6.3	8.8	12.0	16.8	3.4	4.6	Int. 264	Diesel	4	4 4x5 1/4	1800	Elec.
23	503	2,720	6,280	8,900	50	226	74	104	74	170	65	65	2.3	4.5	8.2	20.4	–	–	–	–	–	4.3	Cont.	Gas	4	6 3 5/16x4 3/8	1800	Elec.
(F)	HUBER-WARCO												0.85	1.6	3.7								GM			6		
24	5D-190	9,560	20,440	30,000	195	346	101	130	112	257	88	86	–4.5	8.5	20.0	(Torque Converter)					1.6	5.6	6-71	Diesel	2	4 1/4x5	1800	Elec.
25	4D-115	6,750	16,600	23,350	115	310	95	128	110	228	80	81	2.6	3.6	5.0	7.0	8.4	11.5	16.7	25.0	3.8	5.3	Int. 525	Diesel	4	6 4 1/2x5 1/2	1800	Elec.
26	4D-85	6,560	16,190	22,750	85	308	95	127	109	228	80	81	2.0	3.5	5.0	6.8	8.2	11.1	16.3	22.2	3.8	5.1	Int. 14-A	Diesel	4	4 4 3/4x6 1/2	1800	Elec.
27	4D-75	6,560	16,190	21,750	75	308	95	127	109	228	80	81	2.0	3.5	5.0	6.8	8.2	11.1	16.3	22.2	3.8	5.1	Int. 350	Diesel	4	6 4 1/2x5 1/2	1800	Elec.
(G)	PETTIBONE																					GM			4		
28	402	6,700	16,340	23,040	123	314	96	126	85	234	83	82	2.3	3.2	4.6	6.2	7.4	10.2	14.8	20.2	3.4	4.6	4-71	Diesel	2	4 1/4x5	1800	Elec.
29	401A	6,135	15,670	21,805	91	314	96	126	85	234	83	82	2.1	2.9	4.0	5.5	6.6	9.1	13.2	18.1	3.0	4.2	GM 3-71	Diesel	2	3 4 1/4x5	1800	Elec.
30	401	5,750	15,540	21,290	65	314	96	126	85	234	83	82	2.1	2.9	4.0	5.5	6.7	9.1	13.2	18.1	3.0	4.2	HER. D.IXC	Diesel	4	6 3 1/4x4 1/2	1800	Elec.

Principal Attachments Available:

- Bulldozers: A B D E F
- Elevating Grader or Conveyor: A B C D E F
- Moldboard Extension: A B C D E F G
- Roller: C
- Scarifier: A B C D E F G
- Snow Plow: A B C D E F
- Snow Wings: A B C D E
- Shoulder Maintainer: B D
- Windrow Eliminator: B E

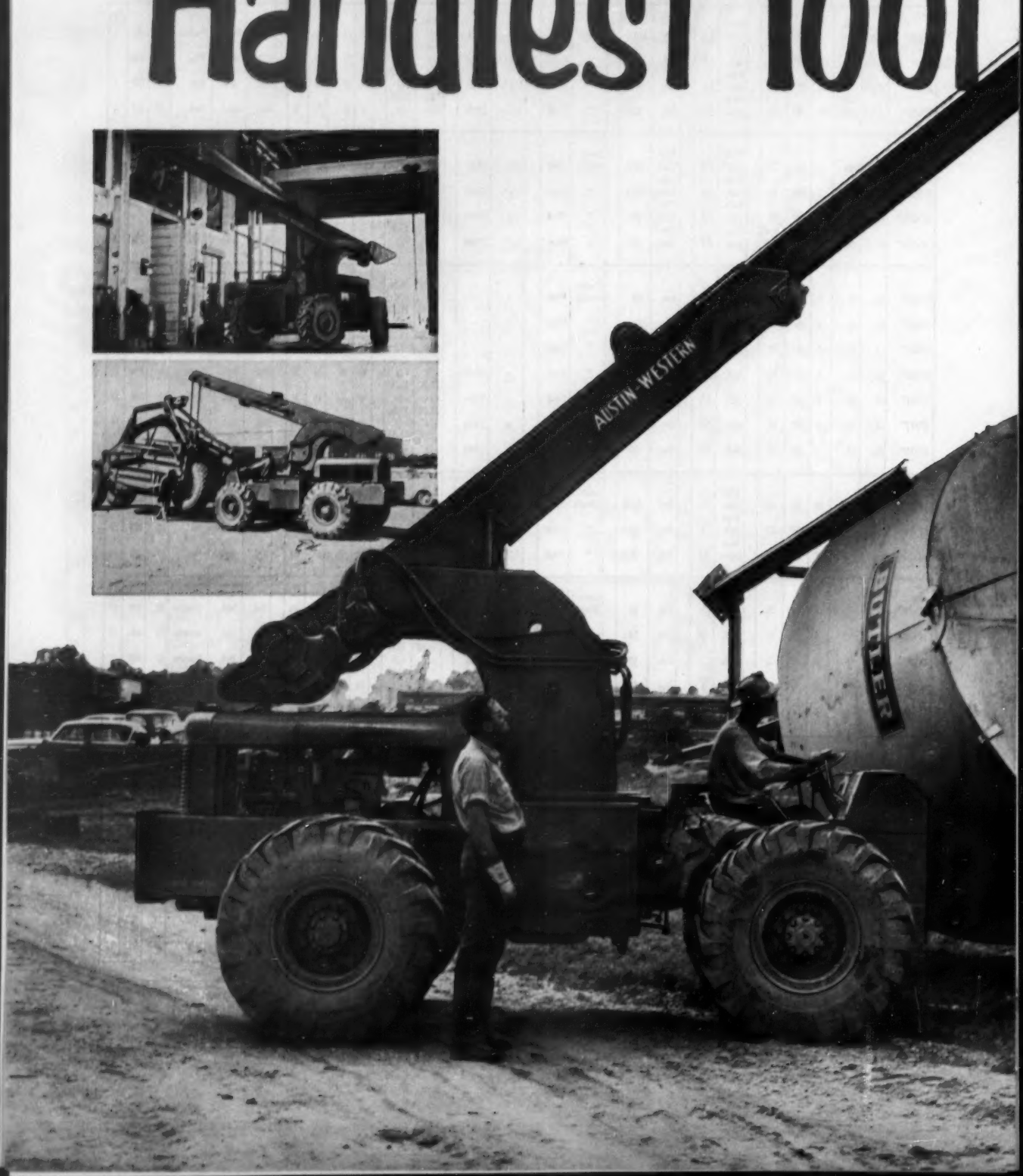
A – Adams • Adams Div., LaTourneau-Westinghouse, Indianapolis, Ind.
B – Allis-Chalmers • Allis-Chalmers Mfg. Co., Milwaukee, Wis.
C – Austin-Western • Austin-Western Co., Aurora, Ill.
D – Caterpillar • Caterpillar Tractor Co., Peoria, Ill.
E – Galion • The Galion Iron Works & Mfg. Co., Galion, Ohio
F – Huber-Warco • Huber-Warco Co., Marion, Ohio
G – Pettibone • Pettibone-Mulliken Corp., Chicago, Ill.

	Size	BLADE: Max. Lift Above Ground	Side Shift	Pitch Positions	Max. Blade Cut Angle	Max. Shoulder Reach	Type	LIFTING MECHANISM: Lift Speed (In. Per Sec.)	Sec. Welded Unit	Wgt. Per Ft. (Lbs.)	FRAME: Front Type	Rear Type	AXLES: Wall Thickness (In.)	TANDEM DRIVE: Type Drive	TIRES: Front	Rear	CAPACITIES: Fuel (Gal.)	Cooling (Gal.)	Crankcase (Qts.)	Transmission (Qts.)	MISCELLANEOUS: Brakes	Controls	Steering	Ground Clearance	Turning Radius (In.)	
Ⓐ	12'x28"	18 3/4	R-36 L-40	13	90°	90	Worm Gear	2.7	Box	120.4	Lean Wheels	Float	5/8-1/2	Chain	14.00 -24	14.00 -24	54	19	24	63	Hyd.	Mech.	Booster	28	456	1
	12'x25"	17 1/4	R-36 L-40	12	90°	90	Worm Gear	2.7	Box	120.4	"	Float	5/8-1/2	Chain	9.00 -24	13.00 -24	54	25	18	63	Hyd.	Mech.	Man.	24	456	2
	12'x23"	17 1/4	R-36 L-40	12	90°	73	Worm Gear	2.7	Box	89.8	"	Float	5/8-1/2	Chain	7.50 -24	13.00 -24	54	17	16	63	Hyd.	Mech.	Man.	23	480	3
	12'x23"	17 1/4	R-36 L-40	12	90°	73	Worm Gear	2.7	Box	89.8	"	Float	1/2	Chain	7.50 -24	12.00 -24	54	13	11	63	Hyd.	Mech.	Man.	23	480	4
Ⓑ	12'x22"	19 5/8	46¼	7	90°	71	Worm Gear	2.5	Pipe Chan.	190.8	Lean Wheels	Float	1/2	Chain	9.00 -24	13.00 -24	66	6½	15	8	Hyd.	Mech.	Booster	24	480	5
	12'x22"	19 5/8	46¼	7	90°	71	Worm Gear	2.5	Pipe Chan.	190.8	"	Float	1/2	Chain	9.00 -24	13.00 -24	66	6½	15	8	Hyd.	Mech.	Booster	24	480	6
	12'x19½"	14 1/2	43½	7	86°	69	Worm Gear	2.8	Pipe Chan.	99.5	"	Float	1/2	Chain	7.50 -24	13.00 -24	43	6	16	8	Hyd.	Mech.	Man.	22	468	7
	10'x15½"	12	5¾	6	–	48-R 42-L	Hyd. Ram	2.2	Pipe Chan.	56	–	Float	1/2	Chain	6.50 -16	7.50 -20	18	12	7	4	Mech.	Mech.	Man.	19	394	8
Ⓒ	13'x22"	16	97	6	90°	89	Hyd.	3.5	Box	119	Power Driven	Float	–	–	14.00 -20	14.00 -20	58	18	18	4	Hyd.	Hyd.	Hyd.	14½	370	9
	13'x22"	16	97	6	90°	89	Hyd.	3.5	Box	119	"	Float	–	–	14.00 -20	14.00 -20	58	12	15	4	Hyd.	Hyd.	Hyd.	16½	370	10
	13'x22"	16	97	6	90°	89	Hyd.	3.5	Box	119	"	Float	–	–	14.00 -20	14.00 -20	58	14	16	4	Hyd.	Hyd.	Hyd.	14½	370	11
	12'x21"	15	82	6	90°	73	Hyd.	3.5	Box	79	"	Float	–	Chain	12.00 -24	12.00 -24	42	8	14	14	Hyd.	Hyd.	Hyd.	14	386	12
	12'x21"	15	82	6	90°	73	Hyd.	3.5	Box	79	"	Float	–	Chain	12.00 -24	12.00 -24	42	7¼	10	14	Hyd.	Hyd.	Hyd.	14	386	13
	12'x21"	15	87	6	90°	80	Hyd.	3.5	Box	79	"	Float	–	Chain	13.00 -24	13.00 -24	42	8	14	14	Hyd.	Hyd.	Hyd.	15	384	14
	12'x21"	15	87	6	90°	80	Hyd.	3.5	Box	79	"	Float	–	Chain	13.00 -24	13.00 -24	42	7¼	10	14	Hyd.	Hyd.	Hyd.	15	384	15
Ⓓ	12'x24"	18	40	13	90°	88	Worm Gear	3	Box	151.4	Lean Wheels	Float	5/8	Chain	9.00 -24	13.00 -24	68	14½	22	58	Hyd.	Mech.	Man.	20	428	16
	12'x24"	16	36	17	98°	77	Worm Gear	3	Box	112.7	"	Float	5/8	Chain	7.50 -24	13.00 -24	60	11	18	56	Hyd.	Mech.	Man.	18	428	17
	10'x20"	15½	33¾	17	90°	60	Worm Gear	2.6	Box	85.25	"	Float	1/2	Chain	7.00 -20	10.00 -24	25	7¾	14	33	Hyd.	Mech.	Man.	17	344	18
Ⓔ	13'x24"	19½	44	6	90°	78	Hyd.	3	Box	60	Lean Wheels	Float	5/8	Gear	14.00 -24	14.00 -24	50	6¾	15	45	Hyd.	Hyd.	Booster	22	480	19
	12'x24"	18½	44	6	90°	72	Hyd.	3	Box	59	"	Float	5/8	Gear	13.00 -24	13.00 -24	50	5¾	15	45	Hyd.	Hyd.	Booster	21	480	20
	12'x24"	18½	44	6	90°	72	Hyd.	3	Box	59	"	Float	5/8	Gear	13.00 -24	13.00 -24	50	13	11	45	Hyd.	Hyd.	Booster	21	480	21
	10'x20"	15½	31	6	90°	61	Hyd.	3	Box	52	"	Float	1/2	Gear	7.00 -24	10.00 -24	33	10½	9	48	Hyd.	Hyd.	Man.	19	432	22
	10'x16"	12	6	6	–	45	Hyd.	3	Box	46	"	Float	1/2	Gear	7.50 -20	7.50 -20	21	3¾	9¼	16	Mech.	Hyd.	Man.	21	372	23
Ⓕ	13'x28"	17	51	6	90°	78	Hyd.	3	Box	130	Lean Wheels	Float	1"	Chain	16.00 -24	16.00 -24	54	9½	24	58	Hyd.	Hyd.	Man.	32	480	24
	12'x26"	17½	R-23 L-28	6	90°	72	Hyd.	3	Box	122.2	"	Float	3/4	Chain	14.00 -24	14.00 -24	54	22½	18	48	Hyd.	Hyd.	Man.	29	480	25
	12'x24"	17½	R-23 L-28	6	90°	72	Hyd.	3	Box	122.2	"	Float	3/4	Chain	13.00 -24	13.00 -24	54	22½	16	48	Hyd.	Hyd.	Man.	29	480	26
	12'x22"	17½	R-23 L-28	6	90°	72	Hyd.	3	Box	122.2	"	Float	3/4	Chain	13.00 -24	13.00 -24	54	22½	11	48	Hyd.	Hyd.	Man.	29	480	27
Ⓖ	12'x24"	18	40	15	90°	86	Hyd.	2.9	Beam	128	Lean Wheels	Rigid	5/8	Chain	13.00 -24	13.00 -24	45	10½	15	48	Hyd.	Hyd.	Hyd.	23	480	28
	12'x24"	18	40	15	90°	86	Hyd.	2.9	Beam	128	"	Rigid	5/8	Chain	12.00 -24	12.00 -24	45	10½	13	48	Hyd.	Hyd.	Hyd.	23	480	29
	12'x24"	18	40	15	90°	86	Hyd.	2.9	Beam	128	"	Rigid	5/8	Chain	12.00 -24	12.00 -24	45	9½	12	48	Hyd.	Hyd.	Hyd.	23	480	30

Reprints of this chart will be available. Address your request to: Editor, Construction Methods & Equipment 330 W. 42nd St., New York 36, N. Y.

AUSTIN-WESTERN HYDRAULIC CRANE

"Handiest Tool



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Why your next CONCRETE PAVER should be a MULTIFOOTE!

The MultiFoote Crawler—shovel-type—rugged alternate lugs eliminate pockets to catch material and gives self-cleaning action—There is no other paver crawler like this.

You buy a paver to make money! MultiFoote Engineers build for ruggedness and performance, with getting the job done in mind.

FIRST: Easy, smooth operation that keeps a job rolling is assured with the high operating platform and the choice of automatic or manual mixing cycle. These things help to make records.

SECOND: The Double Cone Drum with its natural scouring and cleaning action, is free from corners that can build up, saves time in cleaning and because it carries the bulk of its load in the center, runs smoothly and evenly for less wear and tear on the machine.

THIRD: Simplicity of design and ease of upkeep cuts maintenance time.

FOURTH: High quality of design and construction reduces down time and insures more trouble-free operation. Take a look at the boom swing and hoist. It is typical of MultiFoote advanced design. Boom swing worm is bronze and both quadrant and worm are enclosed and run in oil. Boom swing drive has friction clutches (not jaw) and drive mechanism is on Timken Bearings. Boom Hoist Bevel Gears are enclosed and run in oil on Timken Bearings.

MultiFoote shovel-type crawlers have self-cleaning action and stand up under miles of travel. Main transmission and travel transmission gears have cut teeth, run in oil and are mounted on Timken Bearings. Ball and roller bearings on all high-speed shafts reduce friction losses to the minimum.

FIFTH: We can't tell the whole story in this space. This is only part of the story. Don't buy a paver without getting the rest of it. Let a MultiFoote man give you more complete information.

BLAW-KNOX COMPANY
Construction Equipment Division
1910 State Street
Nunda, New York

BLAW-KNOX

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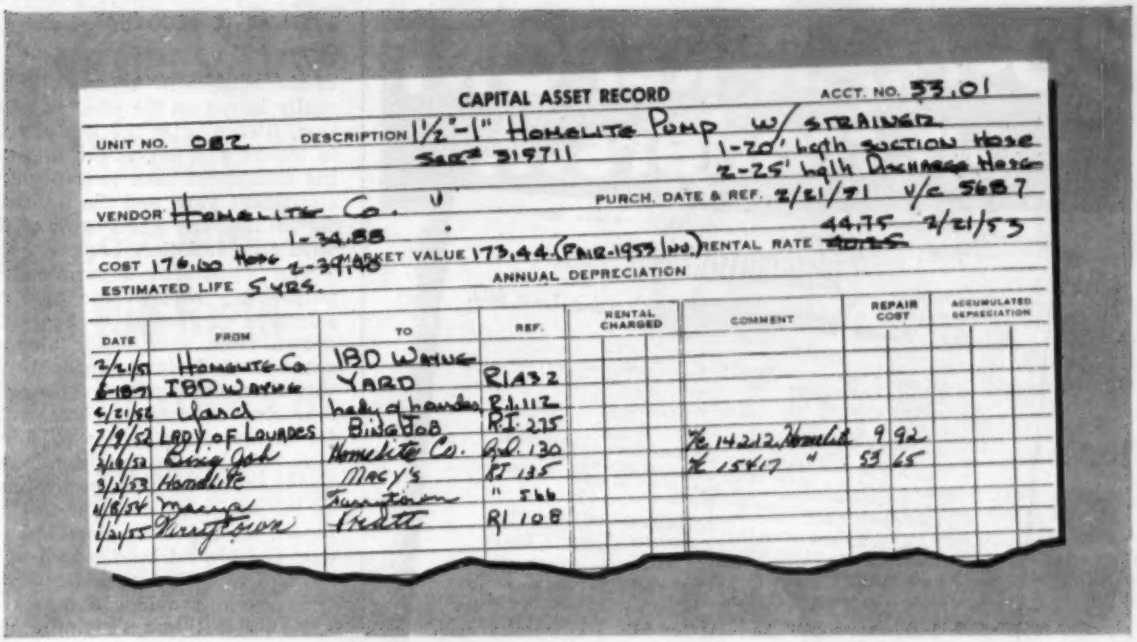
FOR EVERY PLACE CONCRETE MUST BE POURED



CAPITAL ASSET RECORD

ACCT. NO. 53.01

UNIT NO. 082 DESCRIPTION 1½"-1" Homelite Pump w/ Strainer
Ser# 319711
1-20' length Suction Hose
2-25' length Discharge Hose

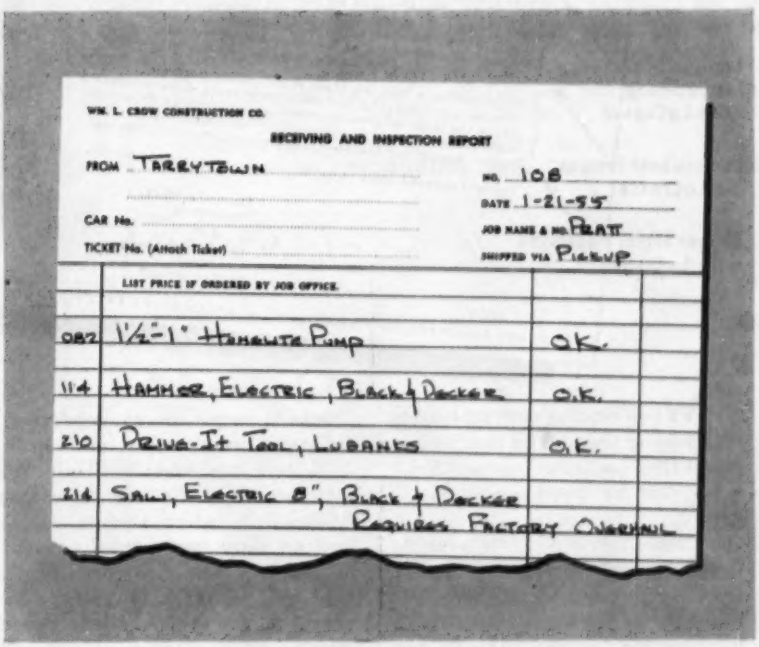
VENDOR Homelite Co. PURCH. DATE & REF. 2/21/51 V/C 5687

COST 176.60 Hose 1-34.88 2-34.48 MARKET VALUE 173.44 (Prior-1953 inv.) RENTAL RATE 44.75 2/21/53

ESTIMATED LIFE 5 YRS. ANNUAL DEPRECIATION

DATE	FROM	TO	REF.	RENTAL CHARGED	COMMENT	REPAIR COST	ACCUMULATED DEPRECIATION
2/21/51	Homelite Co	IBD Wayne					
6-1951	IBD Wayne	Yard	R1432				
6/21/52	Yard	Bldg of Lourdes	R1 117				
7/9/52	Lady of Lourdes	Bldg Job	R1 225				
4/6/53	Bldg Job	Homelite Co.	R1 130		Re 14212 Homelite	9 92	
3/2/53	Homelite	Macy's	R1 135		Re 15417 "	53 65	
4/8/54	Macy's	Tarrytown	" 566				
1/21/55	Tarrytown	Pratt	R1 108				

Systematic Records Keep Tools at Work



WM. L. CROW CONSTRUCTION CO.

RECEIVING AND INSPECTION REPORT

FROM Tarrytown NO. 108

DATE 1-21-55

CAR No.

JOB NAME & NO. Pratt

TICKET No. (Attach Ticket)

SHIPPED VIA Pickup

	LIST PRICE IF ORDERED BY JOB OFFICE.	
082	1½"-1" Homelite Pump	O.K.
114	Hammer, Electric, Black & Decker	O.K.
210	Drive-It Tool, Lubanks	O.K.
214	Saw, Electric 8", Black & Decker	Requires Factory Overhaul

MISLAID TOOLS are a problem to contractors. Rather than spend time looking for a missing tool, particularly small ones, many contractors rent or buy a similar one, which is poor economy.

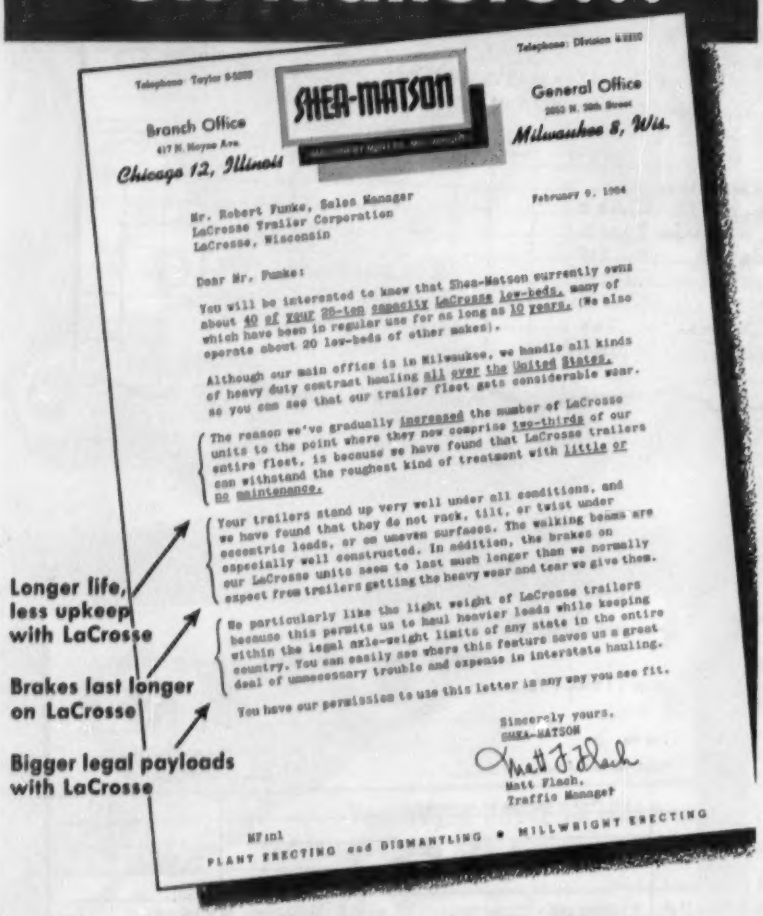
Because tools are shifted from one job to another, a careful record of their location and condition is essential, if they are to be readily available. The William L. Crow Co. of New York, has met this problem with a simple, but efficient equipment accounting system.

As soon as a tool is bought, it receives an identifying number which is affixed in a prominent place. A card bearing this number is added to the company's equipment file. This card tells the type of tool, manufacturer, model, serial number, vendor, date of purchase, cost, estimated life, inventory value of the equipment, and rental rate. Space is provided for a continuous recording of dates of transfers between projects, and repair costs.

Equipment transfers within the Crow organization are always accompanied by a Receiving and Inspection Report showing the job transferred from and to, the date and the condition of the equipment. As the reports are received at the home office, the equipment control clerk notes the present location of the equipment on the individual equipment records, the date of the transfer, and the number of the report covering the transfer. Should the report indicate the tool to be in need of repair, the clerk at the time brings it to the attention of the equipment superintendent. The superintendent decides whether it will be repaired on the site, returned to the factory for major overhaul or disposed of and replaced.

This system has the advantage of providing a check on the condition

10-YEAR REPORT on trailers...



Telephone: Taylor 9-5200

SHEA-MATSON

Branch Office
417 N. Hoyne Ave.
Chicago 12, Illinois

Telephone: Division 4-8800

General Office
2053 N. 30th Street
Milwaukee 8, Wis.

February 9, 1954

Mr. Robert Funke, Sales Manager
LaCrosse Trailer Corporation
LaCrosse, Wisconsin

Dear Mr. Funke:

You will be interested to know that Shea-Matson currently owns about 40 of your 20-ton capacity LaCrosse low-beds, many of which have been in regular use for as long as 10 years. (We also operate about 20 low-beds of other makes).

Although our main office is in Milwaukee, we handle all kinds of heavy duty contract hauling all over the United States, so you can see that our trailer fleet gets considerable wear.

The reason we've gradually increased the number of LaCrosse units to the point where they now comprise two-thirds of our entire fleet, is because we have found that LaCrosse trailers can withstand the roughest kind of treatment with little or no maintenance.

Your trailers stand up very well under all conditions, and we have found that they do not rack, tilt, or twist under eccentric loads, or on uneven surfaces. The walking beams are especially well constructed. In addition, the brakes on our LaCrosse units seem to last much longer than we normally expect from trailers getting the heavy wear and tear we give them.

We particularly like the light weight of LaCrosse trailers because this permits us to haul heavier loads while keeping within the legal axle-weight limits of any state in the entire country. You can easily see where this feature saves us a great deal of unnecessary trouble and expense in interstate hauling.

You have our permission to use this letter in any way you see fit.

Sincerely yours,
SHEA-MATSON
Matt Flesch
Matt Flesch,
Traffic Manager

MF:ml

PLANT ERECTING and DISMANTLING • MILLWRIGHT ERECTING

Longer life, less upkeep with LaCrosse

Brakes last longer on LaCrosse

Bigger legal payloads with LaCrosse

When leading contract haulers, whose living depends on their trailers, prefer ONE particular low-bed 2 to 1, there must be good reasons.

Take Shea-Matson Inc., for example. During the past 10 years, this nation-wide operator has experimented with *all* types and makes of trailers. In addition, they've kept accurate payload and maintenance records on each one. So, when you learn that Shea-Matson Inc. has already converted *40 out of 60* of their low-beds to LaCrosse, it's a pretty good indication that LaCrosse is the *best buy for you, too.*

Thanks to larger volume, production, LaCrosse trailers often cost up to 38% less than other low-beds. You also save up to 2000 lbs. of useless dead-weight, which enables you to haul an extra ton of legal payload. But the real reason why experienced haulers prefer LaCrosse trailers is because they're built better to last longer. Bigger, safer brakes! Stronger, longer lasting main frame and deck! Stronger axles and wheels! Write today for free descriptive literature on job-proved LaCrosse low-beds — 6 to 75-ton capacity — with flat, drop or tilting platforms. LaCrosse Trailer Corp., LaCrosse, Wis. LC-34

LaCROSSE
America's Favorite LOW-BED TRAILER

SYSTEMATIC RECORDS . . .

Continued

of the equipment before it is actually in use on the site. In addition, it eliminates the loss of time in transit and rehandling in sending equipment back to the central equipment yard and the necessity for maintaining a mechanic at the yard on a full-time basis.

The equipment superintendent periodically reviews the card file selecting equipment to be withdrawn from service for maintenance or a factory overhaul. At this time, units with a history of excessive maintenance are noted for further investigation to determine whether the condition is due to improper use and maintenance on the site or whether the tool has passed the point of economical repair and should be disposed of.

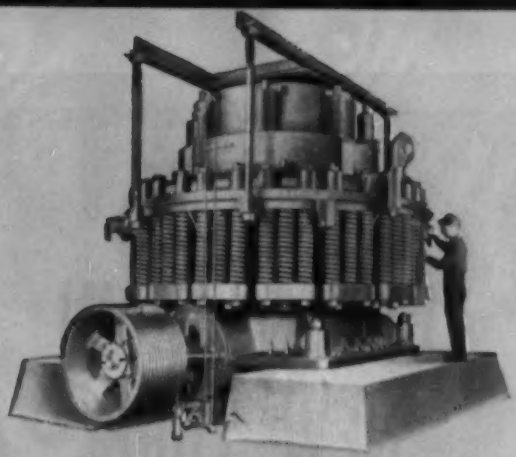
The Crow Co's equipment control system provides a means of reducing tool loss and improving maintenance. It is also a valuable aid in distributing equipment costs to the company's projects, because it provides a record of time on the site and expense chargeable.

This system is also furnishing a wealth of information on the cost of ownership of the various items of building contractors' equipment.

WHEN THE STEADY REST on his grinder wore down so that he was having trouble steadying his work, this tool maintenance man rebuilt it by brazing a Carboloy grade 883 carbide tool blank to the conventional rest. He reports the wear resisting carbide "nose" lasts longer than the standard rest, and offers better support as he reproduces proper grinds on carbide chippings and finishing tools for the Scio, Ohio, Pottery Co.

SYMONS®

CONE CRUSHERS Produce Aggregate and Sand to the Rigid Specifications of the Construction Industry



SYMONS Cone Crushers . . . the machines that revolutionized crushing practice . . . are built in Standard, Short Head, and Intermediate types, with crushing heads from 22 inches to 7 feet in diameter—in capacities from 6 to 900 tons per hour.

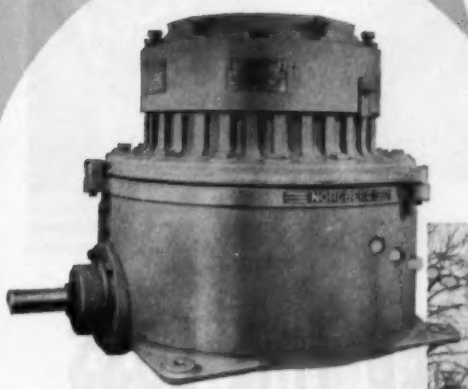
To meet the constant demand for vast tonnages of specification concrete and bituminous aggregates and quality sand, the construction industry today depends on Symons Cone Crushers, long the first choice of leading producers and used throughout the world in the construction of dams and hydro projects, highways, bridges and commercial and residential buildings.

For in aggregate and sand production . . . *as in all of the great ore and industrial mineral operations the world over* . . . there has been no record to equal the performance of Symons Cone Crushers that have so consistently and efficiently produced great quantities of crushed product at low cost.

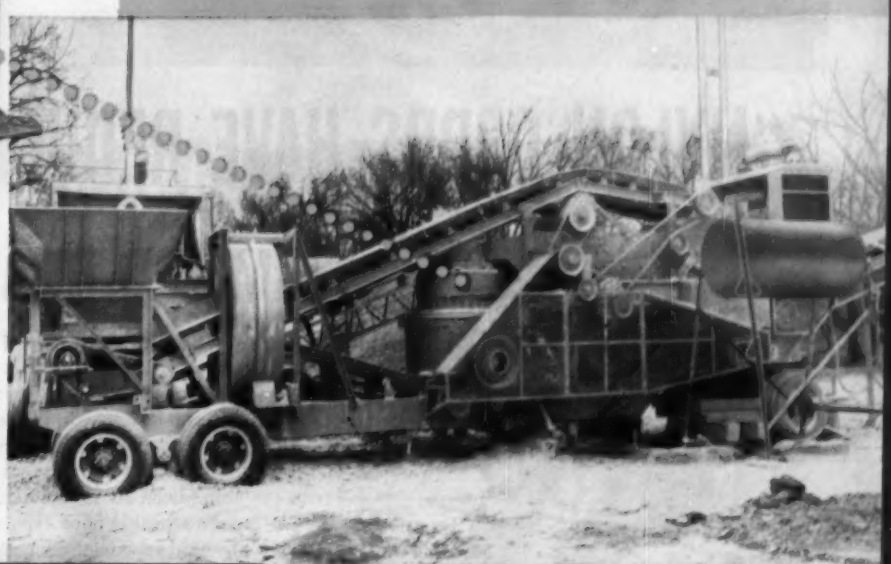
Whether you are a contractor, operator, construction engineer, designer or manufacturer, it will pay you to specify and use Symons Cone Crushers . . . as well as the other Nordberg Machinery for the construction industry . . . *all* designed and built to deliver maximum output at lowest possible cost.

Write for literature on the machinery you need.

NORDBERG MFG. CO., Milwaukee, Wis.



Long accepted by experienced contractors and producers for efficient *stationary* crushed aggregate plants, increasing numbers of successful operators of *portable* and *semiportable* crushing plants are now using these sturdy, economical Symons Cones for big capacity of fine product . . . such as this Cedarapids Model 30 C Portable Cone Crusher Secondary Crushing and Screening Plant, utilizing a 30" Symons® Intermediate Cone Crusher as standard equipment.



SYMONS . . . *A REGISTERED NORDBERG TRADEMARK KNOWN THROUGHOUT THE WORLD*

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MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

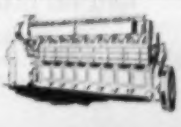
NEW YORK • SAN FRANCISCO • DULUTH • WASHINGTON
TORONTO • MEXICO, D.F. • LONDON • JOHANNESBURG

SYMONS GYRATORY CRUSHERS

NORDBERG GRINDING MILLS

SYMONS VIBRATING SCREENS

SYMONS VIBRATING GRIZZLIES



NORDBERG ENGINES . . . 10 to over 12,000 H.P.

C555

"NYLON CORDS HAVE REDUCED TIRE LOSS

says JAMES D. BRADLEY, in charge of truck maintenance, Metropolitan Sand and Gravel Corp., Flushing, N. Y.

"We operate one of the largest ready-mixed concrete, sand and gravel companies in the New York metropolitan area. We keep 120 trucks rolling 8 hours a day, 5 days a week, hauling concrete to all types of construction projects. Our tires take a terrific pounding from rocks and debris at new construction sites. They have to be able to take repeated impacts.

"To get tires that would survive this rugged treatment, we started using nylon cord tires in 1953. Since then, nylon cords have brought down our tire loss due to cuts and impacts 39%. Practically all our tires are now nylon cords. Replacements are all nylons, and we request nylon cord tires on all new equipment.

YOU'LL FIND NYLON IN PASSENGER-CAR TIRES, TOO! Impact-absorbing nylon cords mean extra protection against blowouts . . . greater safety on any road.

DUE TO CUTS AND IMPACTS 39%"

We've found that nylon cord tires stand up better under jarring impacts—give us longer service at lower cost per mile. Are we sold on nylons? I'll say. We recently bought a whole carload!"

For ten years Du Pont and leading tire manufacturers have been working together to perfect nylon cord truck tires. Now actual road experience proves nylon offers extra protection against tire failure. Truck users' reports show nylon cord tires mean fewer road delays, more mileage, more recaps—lower cost per mile.

Nylon has greater tensile strength, flex and abrasion resistance than any other cord used in tires. Nylon virtually ends cord ruptures caused by bruise breaks. Moisture seeping through cuts doesn't damage nylon. Nylon can take the hottest road temperatures you'll ever encounter in normal operations.

Prove to yourself that nylon cord truck tires give substantially lower cost per mile. Ask your dealer about nylon cord truck tires today. (Du Pont makes the tough nylon yarns, does not produce tires.)

DU PONT NYLON FOR TIRE CORD

DU PONT

REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

FREE BOOKLET on nylon tires—write for your copy. Textile Fibers Dept., Room 11508, E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Del.

A FLEET OF more than 60 earthmoving rigs, operating over 1-mi haul roads, hauls fill at the rate of 2,000 yd per hr on the Buford Dam in Georgia to complete contract a year ahead of schedule set up by Corps of Engineers, U. S. Army.

Dirt Flies at Buford Dam

ANY TIME A CONTRACTOR can move nearly 4,500,000 yd of earth and rock in 12 months less than had been scheduled there has to be some sound explanation behind the entire operation.

J. W. Moorman & Son of Muskogee, Okla., who recently completed a $1.8 million contract at Buford Dam on the Chattahoochee River near Atlanta, Ga., by moving fill at the rate of 2,000 yd per hr, has these explanations. According to Jim Moorman, a son in charge of the earthmoving project, the reasons are not mysterious at all but just good business practice.

BIG REASON for fast earthmoving schedule is exacting greasing and maintenance program. This mobile service station requires only 3 min to fully grease each rolling machine.

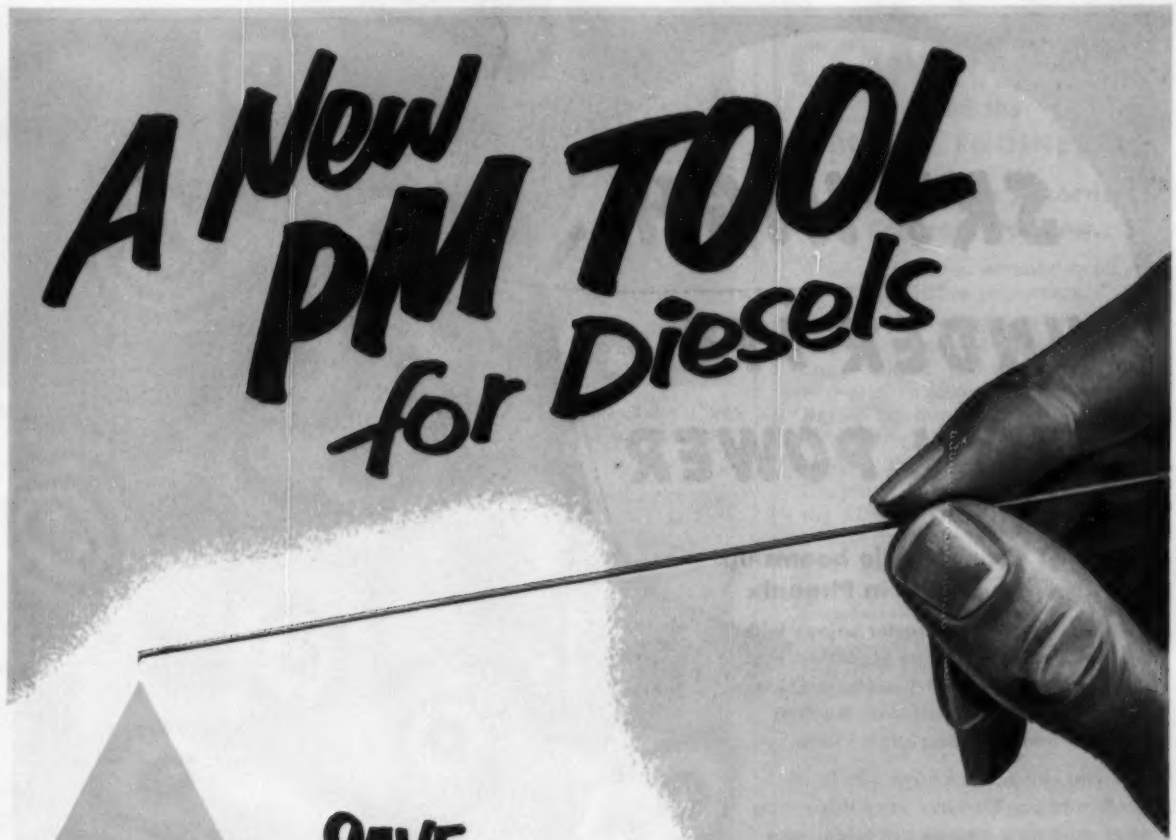
"The fact we finished almost a year ahead of schedule was largely because the Corps of Engineers gave us a slow schedule. Then too, we anticipated a lot of rainy weather which fortunately didn't arrive. These two conditions over which we had no control were good breaks. But we also had some good breaks we were 100% responsible for."

The breaks Jim refers to started before the job ever began. Instead of shipping 60 pieces of earthmoving equipment 1,000 mi from Texas to the Buford Dam site, they "roaded" it. This move saved about $500 on each piece of equipment.

Once the equipment and the 100 regular employees arrived on the project, the word "maintenance" took on a new and important meaning. "We believe in maintenance with a capital M on every one of our jobs," emphasizes Jim Moorman. A tour of any of the

(Continued on page 87)

A New PM TOOL for Diesels



SAVE Time, Money, Oil and Engines with the Shell ADC* Oilprint Analysis

Now—operators can test crankcase oil in the short time allotted for re-fueling and oil level checks. The Shell ADC Oilprint Analysis gives a practical and accurate oil evaluation in minutes.

ADC Oilprint Analysis means big savings when used in your preventive maintenance program . . . gives valuable information on engine and oil conditions. It answers the question "When do I change my oil?" thus eliminating the draining of usable oil and the risk of using oils loaded with contaminants.

See for yourself how the new Shell ADC Oilprint Analysis can save you real money in preventive maintenance. *Trademark

Let us demonstrate how you can use this Service for Your Diesels

SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

SHELL

SKY HIGH UNDER ITS OWN POWER

BAY CITY CraneMobile booms up construction profits in Phoenix

The advantages a contractor enjoys with a CraneMobile are neatly explained by H. J. Hart of the H & R Transfer & Storage Co. of Phoenix, contractor on the First National Bank Building shown here . . .

"As you can see we have 135 ft. of boom and jib. We have used this set-up quite a bit now and no use telling you how nice the rig handled. Our rigs are the only ones in Phoenix that can be rigged with 135' of boom and jib and raised without the help of another crane. You fellows really put together a machine."

That's strong praise, and only a proven crane could earn it. In fact contractors everywhere have found the Bay City CraneMobile an exceptionally efficient money maker for an amazingly wide variety of jobs. Why not write for our catalog today.

252

BAY CITY SHOVELS, INC. • BAY CITY, MICHIGAN

BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

WATER WAGONS keep heavy dust down and aid in compaction. The contractor, J. W. Moorman & Son, Muskogee, Okla., converted two 20-yd Euclid belly-dumps to do the work.

SURPLUS AVIATION tires prove satisfactory on trailing wheels of scrapers. The wheels required slight modification, but the tires were purchased by contractor for $100 each.

THIS MAINTENANCE SHOP goes along on each new job. It can be erected or dismantled in 3 days. Curtained doors hung on 1-in. pipe provide adequate lighting and ventilation.

firm's projects will verify this statement.

Every project needs a maintenance shop, and Moorman has one he takes along on each job. It's a bolted beam and sheet-metal structure with curtains for an opening on one side in case of inclement weather. It can be erected or dismantled in 3 days. This shop is the hub of the maintenance program.

Part of the shop is devoted to spare parts. On the Buford project $160,000 of parts inventories were in stock. Moorman makes the flat statement that such a shop will pay for itself twice over in a year's time.

One important and unusual practice this contractor follows is running-in an engine on a stand. After it has had an overhaul, the engine is run-in for a 100-hr period. It's idled for 20 hr, operated at intermittent throttle for 70 hr, and at maximum rpm for the final 10 hr.

(Continued on page 90)

COMMENT
from the BUTLER ENGINEER

. . . of World's Records in Concrete Pouring

This column is notably brief . . . and notably important.

Brief to invite your attention. Important, because it deals with one — and I think — possibly two world's records. Both with Butler Equipment.

FIRST, Grover C. Denny, Project Engineer for Merritt-Chapman & Scott, said that on the $100,000,000.00 Mackinac Straits Bridge —

6500 cubic yards of concrete were poured in the bridge foundations during a 24-hour day to set a new world record.

Grover Denny amplified his statement: "That would be enough concrete to make a mile and a half pavement 22 feet wide."

All this concrete was poured from a floating plant that was Butler-designed and Butler-built.

Those of you handy with a slip-stick, figure how many truck mixers would be needed on a job to do it.

But the big point is: they're getting ready for new world's records. And, of course, with equipment Butler is furnishing.

Then, in the roadbuilders' field, there's another record — and possibly a world's record, too. Sargent Construction Co. on the Ohio Turnpike paved 2100 lineal feet in a 10-hour day. The slab was 24 feet wide and 10 inches thick.

Nine bags of cement per batch were weighed off and loaded at the rate of 840 batches in 360 minutes.

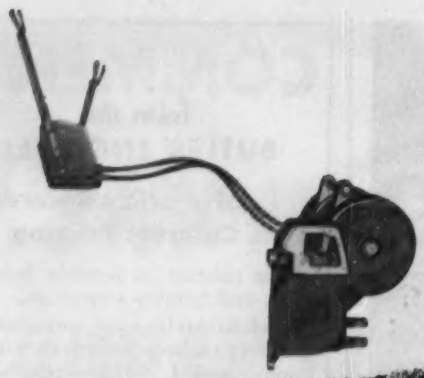
Is my slip-stick right? That's 2.3 batches plus per minute.

Anyway, Butler knows how to design equipment for the fellows who know how to pour — *World's records*

Yours happily,

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN



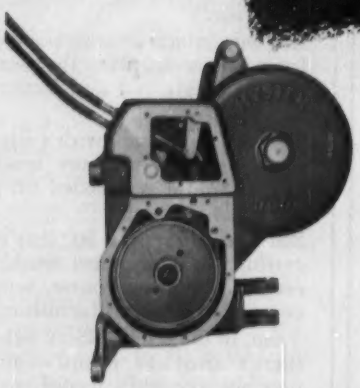
NEW HYSTER® WINCHES FOR THE NEW CAT* D7 & D8 TRACTORS

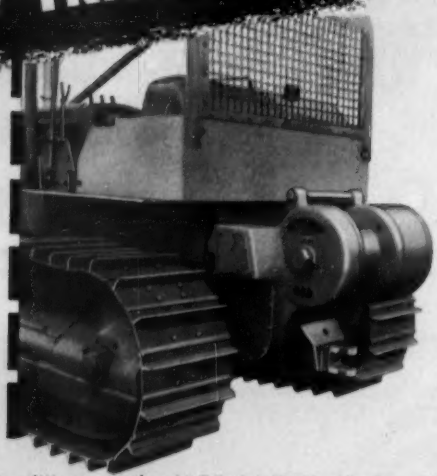
1

2

3

4





1 **Personalized Control Mountings** — New flexible cable control makes it easy to mount control lever bank in exact position most convenient for each operator. Flexible cable is threaded under tractor seat—completely protected from wear and damage. *All control cranks and links are totally enclosed for maximum protection.*

2 **Smoother Shifting, Longer Gear Life** with new Hyster Constant-Mesh Transmission. Gear design, with maximum tooth contact-ratio, assures positive action. All gears are case-hardened for longer life.

3 **Large Capacity Brakes** are designed to hold loads larger than can be moved by winch line. Cover plate can be quickly removed for easy external adjustment.

4 **Built In Drawbar** — can be quickly changed from rigid to swiveling action by removing two lock plates. Drawbar shaft is precision fitted in bronze graphite bushings.

Completely redesigned for use on the new Cat D7 and D8 Tractors, the new Hyster Model D8D (illustrated) add Model D7D winches will also be used on older model Cat D7 and D8 Tractors.

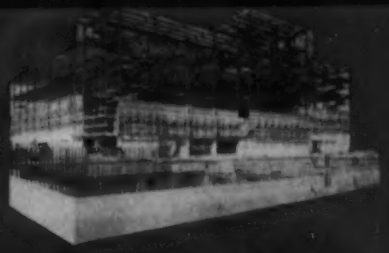
Hyster winches increase tractor pulling power up to 100% over straight drawbar pull—extend tractor reach to the end of the winch line. A Hyster winch can reduce costs on your job.

See your Caterpillar-Hyster Dealer or write direct to Hyster Company, 2921 N.E. Clackamas Street, Portland 8, Oregon, or 1821 N. Adams Street, Peoria 1, Illinois.

HYSTER COMPANY

*Cat and Caterpillar are registered trademarks of the Caterpillar Tractor Company

big savings of time and money!



Site for Department Store, North Hollywood, California. Albert C. Martin, Architect; T-S Construction Engineers, Inc., General Contractor.

on another job with Whiteman equipment

At least 20 hand buggies and 20 men would be required to haul and pour the concrete being handled by 4 Whiteman Power Buggies on the May Co. job. They're gluttons for work. Never get tired or slow down.

T-S CONSTRUCTION ENGINEERS, INC.
6200 ST. PAUL AVENUE
LOS ANGELES 17, CALIFORNIA

PAUL B. TICHENOR, PRESIDENT
MERLE F. SMITH, VICE PRES. & TREASURER
PETER STERLING, SECRETARY
MADISON 9-1121

February 14, 1955

Whiteman Manufacturing Company
3240 Casitas Avenue
Los Angeles 39, California

Gentlemen:

You will be interested in knowing how Whiteman Power Buggies have speeded up the May Company job and effected a very substantial saving in labor costs.

We have handled as much as 375 yards in 5 hours with 4 Buggies, on upper floors, with hauls averaging 225 feet. We don't know what we would have done without them.

Yours very truly,

T-S Construction Engineers, Inc.

Paul B. Tichenor

Paul B. Tichenor
President

WHITEMAN VIBRATORS are efficient, rugged, dependable. Three models, gas and electric, are "tailored to the job." Complete line of vibrator accessories.

WHITEMAN SCREEDING MACHINES do a better job in far less time. Screed to a perfect level. Save labor. Easily portable. Width adjustable from 3 ft. to 20 ft.

WHITEMAN FLOATING-FINISHING MACHINES produce a smooth, perfect slab. Job-proved for 17 years. Four models — one for any job requirement.

Whiteman

THE LEADER IN CONCRETE EQUIPMENT

SEND NOW!

Whiteman Manufacturing Co.
3249 Casitas Ave., Dept. C
Los Angeles 39, Calif.

Please send prices, literature and name of distributor for ☐ Vibrators, ☐ Screeding Machines, ☐ Power Buggies, ☐ Floating-Finishing Machines.

Name _____

Firm _____

Address _____

City _____ Zone ____ State ____

The Sherman Front End Loader Gives You "REACH YOU CAN USE!"

The "secret" is proper location of the lift frame pivot point. Sherman keeps the bucket in close at grade level for better maneuverability and traction . . . yet extends it to maximum distance from the tractor at loading and intermediate heights for extra loading reach.

This Sherman design feature gives you more usable reach than any comparable machine! It gives you loading height . . . a full 10′10″. And it loads to the front end of an 8′ truck body from the rear. This practical combination of maximum useful loading height plus maximum useful loading reach is further combined with a "balanced design" for the utmost in operating stability.

Sherman's husky main frame transmits loads to the tractor rear axle, giving greater traction and performance. Twin heavy duty tilt cylinders crowd buckets or attachments right in to do a real job on excavating, loading, bulldozing and a score of other jobs. All wear parts are heavy duty . . . designed to stand up longer with minimum maintenance. Two models are available . . . up to 2500 pounds bucket capacity, 4500 pounds breakaway capacity.

The Sherman Front End Loader is economical, easily installed, safe and easy to operate . . . sold and serviced by your local Ford Tractor dealer. Ask him for an on-the-job demonstration today . . . or write for Bulletin 817.

Sherman
PRODUCTS, INC.
ROYAL OAK, MICHIGAN
POWER DIGGERS • FRONT END LOADERS* • FORK LIFTS

*Manufactured Exclusively for Sherman Products, Inc. by Johnson Hydraulic Equipment Co., Minneapolis, Minn.

©1955, Sherman Products, Inc.

BUFORD DAM . . .

Continued from page 87

This run-in period insures a trouble-free engine when it is installed in the earthmoving rig.

The shop employs a foreman, four mechanics, two helpers and a full-time parts man.

Another cost-cutting feature in the Moorman spread is the tire replacement program. An experiment being tried by this contractor is the use of surplus airplane tires on trailing wheels of scrapers. These 28:00x25:00-32 ply units were purchased for $100 each. The trail wheel on the Euclid scraper requires conversion to accommodate the tires, and this cost amounts to $50 per wheel. The conversion is simply a rim that spot welds on the wheel itself to adjust it to the tire size. According to Moorman, the aviation tire has worked out quite successfully and represents a big savings in tire costs.

Another economy measure effected on this job was re-capping tires. The average cost of a recap on the large size tire was around $525. Moorman usually awards a tire contract to a local concern when the firm moves in on a job. The successful bidder inspects all the tires on rolling equipment at least once a week and handles replacements and recaps. This practice cut tire costs about one-third of former costs.

Lots of Equipment

Moorman had an impressive fleet of equipment to maintain on the Buford project. It included 22 scrapers, 35 belly-dumps, 8 end-dumps, 6 water wagons, 3 motor graders, 25 tractors (both wheel and crawler type) and 3 Bucyrus-Erie 2½-yd shovels, plus rollers and disks.

All this equipment was greased and maintained on the job on the fly. Each machine had a big number painted on the side, and each day every rolling piece of equipment was greased by number. The grease rig, a World War II 6x6, is fully equipped even to a small generator for night-time operation. Four oilers are employed on the unit. The piece of equipment to be greased was flagged down and in 3 min it was completely greased and ready to roll. W. B. Keene Jr., job foreman, claims it is easier to grease a machine when the machine is hot—and it is helpful, too, to have the driver present because he can then report daily any mechanical failures.

Engine oil was changed every 100 hr. Crawler equipment was fueled by tank truck, while a 15,000-gal tank in the borrow pit and service area was available so that wheeled equipment could self-service with a minimum of delay.

On the dam project Moorman consumed about 4,000 gal of fuel, 1 bbl of oil and ½ bbl of transmission and differential grease daily. About 800 lb of grease was used each week.

In estimating a job, Moorman figures about 2% of every job will go for fuel, oil and grease. On the Buford Dam job for example he expended, in less than one year's time, $60,782 for diesel fuel alone and another $21,669 for oil and grease.

Jim Moorman used conventional tricks of the trade, plus a few not so conventional, to move that 4,500,000 yd of earth in record time. But when you add up the entire operation, the job was excellently planned in advance. The fact it was finished so far ahead of schedule was a surprise to a lot of people—but not to J. H. Moorman and Sons.

For Defense Contractors

A NEW HANDBOOK describing the Defense Materials System should interest contractors doing work for the Department of Defense or the Atomic Energy Commission. Contractors doing defense work for these two agencies have the responsibility for acquainting themselves with the rules and regulations of the system, which is designed to assure the completion of military and AEC programs on time and to provide a control system to handle quickly expanded military needs for materials in the event of an emergency.

The 41-page booklet titled "The Defense Materials System in American Industry" has been arranged so that each type of contractor and supplier may find handy reference to the general rules applicable to his defense contract operations.

The booklet, available for 25c from the Government Printing Office, Washington, D.C., or Department of Commerce field offices, also discusses the subcontractor's responsibility under the Defense Materials System.

"Our Sherman Power Diggers Are Easy to Handle and Maneuver in Tight Places"

One of the two Sherman Power Diggers owned by I. & M. Contracting Co., Bronx, New York, is shown on a trenching job for a public utility company in Long Island City.

Mr. Elio Mazella, co-owner of the contracting firm states: "Sherman Power Diggers are exceptionally good. They are easy to handle and maneuver in tight places. In comparison with former excavating methods. these diggers save us at least 70 per cent."

Sherman's speed, maneuverability and easy operation appeal to custom operators, contractors, utility companies, municipalities . . . everyone who wants the savings of mechanized excavating. Even on the smallest jobs the Sherman is practical, since it releases heavier equipment for bigger jobs . . . yet it digs in a fraction of the time and cost of manual labor.

Use the Sherman Power Digger as deep as 10 feet below ground . . . in mud, hardpan, shale, oiled roads, blacktop and stony ground. Initial cost is surprisingly low, and maintenance is simple and inexpensive. Ask your Ford Tractor dealer for an on the-job demonstration, or write today for Bulletin No. 818.

*Designed, Engineered and Manufactured Jointly by Sherman Products, Inc., Royal Oak, Michigan. Wain-Roy Corporation, Hubbardston, Mass.

Patent No. 2-303-852 Other Patents Pending

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ROYAL OAK, MICHIGAN
POWER DIGGERS* • FRONT END LOADERS • FORK LIFTS

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NEW Power... New gearing... New ruggedness—for greater production

NEW Track Frames... 300 per cent stronger

NEW Finger-Tip Power Steering... advanced hydraulic design

NEW Operator Compartment... comfortable driver's seat—easy-to-reach controls

NEW Track Roller Oil Seals... 500-hour period between lubrications

NEW Positive Self-Energizing Brakes, 13% more effective brake area

NEW Appearance... sleek grille, heavy fenders, 75-gallon fuel tank. Better visibility... control-tower view front and rear

LOOK AT THAT LOAD as operator applies 103-drawbar hp of new TD-18A. Steering is effortless with new hydraulic finger-tip controls and positive, self-energizing brakes.

TD-18A Now with 103 Drawbar H.P.

Here's the crawler tractor with everything contractors need to meet increased competition—increased workpower, increased ease of operation, increased durability:

The improved INTERNATIONAL TD-18A, now with 103-drawbar horsepower at 24,300 lbs. maximum drawbar pull in first gear at rated rpm.

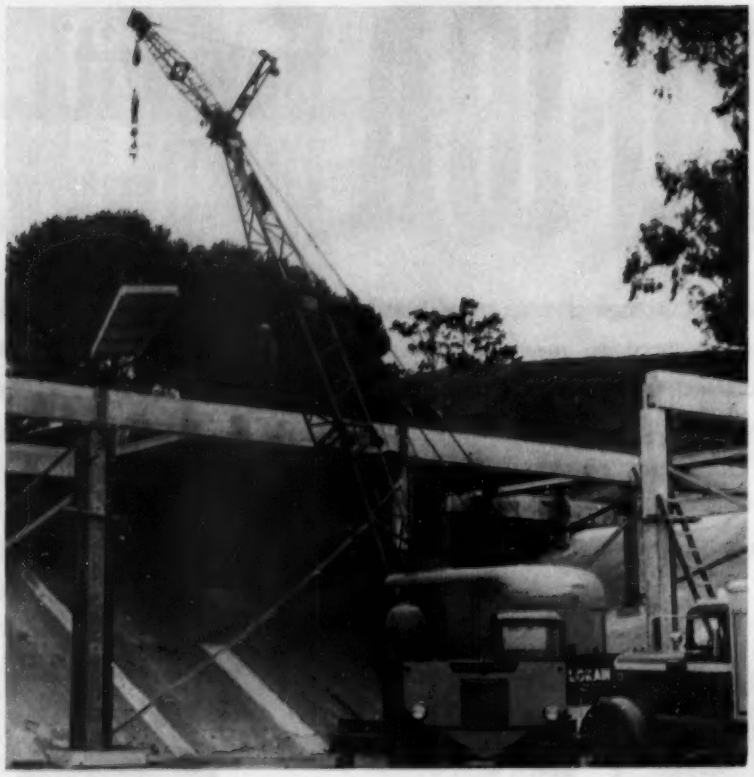
Double check all these great new TD-18A features —right here on these pages—on your job where you can take over the controls and appraise their value in extra work done for lower cost. Your INTERNATIONAL Industrial Power Distributor will arrange your own personal shake-down test of the TD-18A any time you say.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

Precast Reservoir Roof Structure

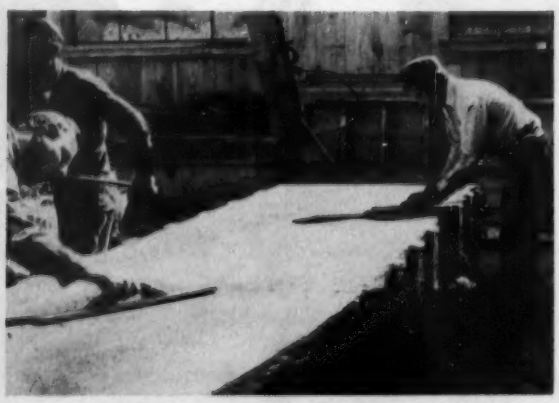
• Thin-shell panels were precast for a big reservoir roof at the new San Pablo Filter Plant in El Cerrito, Calif. P. Grassi-American Terrazzo Co., of San Francisco, cast and placed about 750 panels, each 24 ft long and 4 ft wide. The 2-in. thick webs of the waffle-like units were reinforced with welded wire fabric.

After the proper curing period, panels were hoisted by crane and placed on precast girders. A load of ten panels could be placed in less than one hour. They were welded to inserts in the girders, making the roof a solid, earthquake-resistant structure.



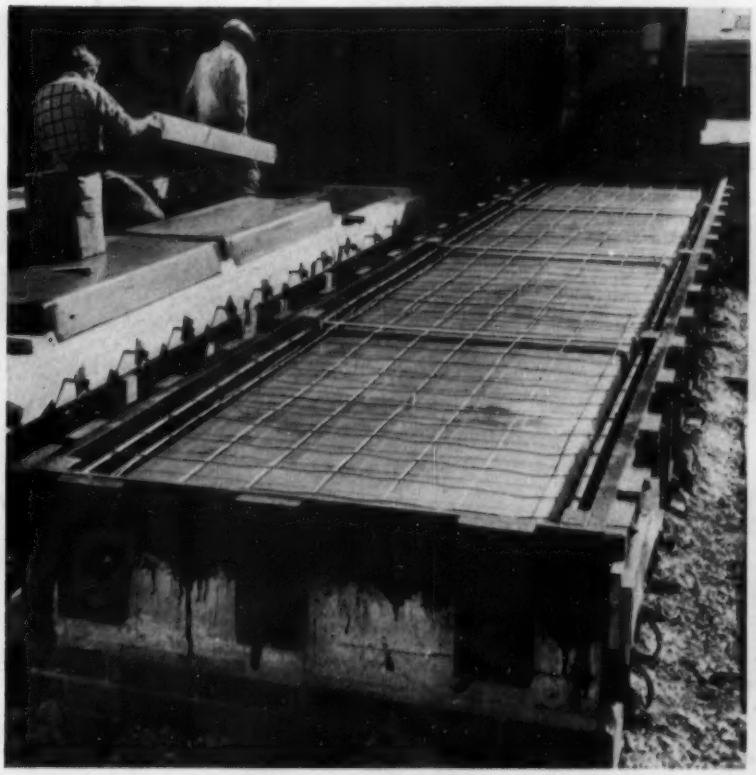
PRECAST ROOF PANEL weighing nearly two tons is lowered on to reservoir roof girders by Lorain Moto-Crane. Job marks beginning of big development in California.

3 CONCRETE IN PANEL FORM is screeded and vibrated by electric powered Viber unit. Bucket suspended from 2-ton Cyclone chain hoist on wheel-mounted gantry is emptied into forms.



4 HAND TROWELING is applied to surface. Final operation is making broom finish. Job requires 741 panels.

5 TARPAULINS are spread over wet concrete to permit an 8-hr steam cure at 150 deg. Forms are then stripped and slabs stockpiled. Erection was done by general contractor E. J. Freethy Co.



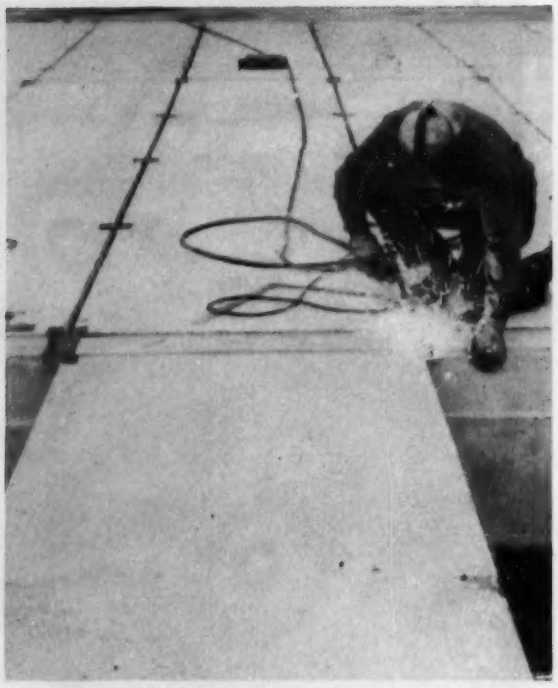
1 CASTING BED for panels consist of sheet-metal-faced wood cores placed on precast concrete beams on brick pilasters. Metal straps anchor cores during pour.

2 CONCRETE BUCKET on Clark fork truck is picked up by gantry.

6 JOB-MADE CRANE moves precast roof panel to stockpile for water curing. Rig also loads panels on trucks for transporting to job. Lifting hooks on balance beam are adjusted to equalize loading.

7 CONCRETE COLUMN is moved into position next to scaffold. Workmen on top of scaffold handles crane sling. When columns are placed, girders are threaded over dowels in column tops.

8 PRECAST ROOF PANEL is placed on girders by truck-crane. Channel side is 8 in. deep and has shelf to retain grout seal. Rosin paper and layer of Flintseal retains grout and waterproofs joint.



9 STEEL PLATE in girder is welded to insert in precast panels, anchoring roof structure. All roof welding is downhand. Job is sponsored by California's East Bay Municipal Utility District.

The 'Edge' that wins the job

Nothing can take the place of the contractor's skill, integrity and responsibility. But *speed* in getting a bond is often the advantage a contractor needs most to get the job. Once your credit line has been established with Indemnity Insurance Company of North America, you are assured of getting bonds without delay . . . and at Indemnity's *low bond rates**. An Indemnity bond carries a special endorsement—putting behind you the experience, reputation and financial strength of America's leading independent market for all forms of bonds and casualty insurance. For speed in service, and the combination of advantages that give the winning edge, consult your Agent or Broker about Indemnity's bonding service.

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Philadelphia 1, Pa.

Big new Oliver Super 99 GM Diesels show power, speed on Iowa road job

Look under the hood of the new Oliver Super 99 GM and you'll find a brand-new kind of tractor power—famous 2-cycle General Motors diesel delivering 72 horsepower on the drawbar. Never before so much power in a general-purpose wheel tractor!

Concrete Materials Company, Cedar Rapids, Iowa, owns five of these new Oliver GM's. Two are shown here pulling double sheep's-foot tampers, preparing black-top base for a new road. Width of the base is only 23 feet, but with a 10'1" turning radius, these tractors turn around without hesitation, without slowing down!

So much power is there in this new Oliver that these two tractors were able to operate mostly in fourth gear, even when pulling 18,000-pound pneumatic finish rollers. Frank Stotts, Superintendent for Concrete Materials Company, put it this way: "The Super 99 GM's are a dream . . . they do the best job of any wheel tractor I have ever been around."

Operating this new tractor is a dream, too. Fuel and upkeep costs are way low, and you'll find six forward speeds, comfortable seat and platform, finger-tip ball steering, differential disc brakes—features that boost production, cut fatigue, make every job go faster, easier. See your Oliver Industrial Distributor for a demonstration.

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400 West Madison Street, Chicago 6, Illinois

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a complete line of industrial wheel and crawler tractors

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Gradall digs Denver building foundation, excavating in rock where other equipment failed.

Gradall®—a single investment that pays off on many different jobs!

That's because a Gradall is always busy—working on many different jobs, all year 'round. Owners report that their Gradalls put in more on-the-job hours each year than any other machine. On the "big jobs" it's a real producer—digging out rock and other tough materials, working in spots no other machine can get to. And on the costly clean-up jobs, it eliminates hand labor, working to as fine as ¼" accuracy with its smooth *arm-action*. On smaller contracts, Gradall often does the entire job using its many interchangeable attachments.

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4 MODELS AVAILABLE

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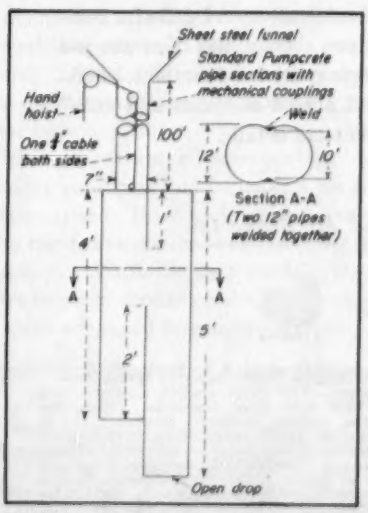
DEEP POUR is fed by two 100-ft pipes with special sumps at the bottom to prevent segregation of concrete. When a pour is completed, the entire assembly is hand-hoisted to the surface by ¾-in. cables and cleaned. Job is in Port Ordaz, Venezuela.



JOB-DEVELOPED SUMP consists of two 12-in. pipe sections welded together along open sides. One section has open bottom.

Sump Attached to 100-Ft. Pipe Cushions Falling Concrete

A TWO-COMPARTMENT SUMP attached to the bottom of a 100-ft vertical pipe prevented segregation of falling concrete on a deep pour in Venezuela. Made of two 12-in. pipe sections welded together along open sides, the sump solved a tough pouring problem for Morrison-Knudsen Co.

A 50x400-ft crusher pit at the Orinoco Mining Project near Port Ordaz required a large amount of concrete. But it was at the bottom of a shaft 100 ft deep. Lowering concrete buckets would have been uneconomical, and chuting it down an ordinary pipe would have caused almost complete segregation.

Instead, they dumped the mix into a steel funnel at the surface, from which the concrete fell down a standard 7-in. Pumpcrete line. A 2-ft reservoir of wet concrete at the bottom of the sump's first compartment cushioned the fall and allowed the mix to overflow into an adjoining section with an open bottom. From here, the completely integrated concrete dropped a short distance to the point of placement. (From M. D. Morris)

Cutting a mountain down to size!

Le Roi Tractair provides low-cost air to help dig 30′-deep cut in hard rock

On this job in Arizona, the mobility of Tractair really paid off. It allowed the contractor to make this 30-ft.-deep drainage cut at the same time he was working on the main part of his contract.

Because Tractair is self-propelled, with a low center of gravity, it travelled over this rocky terrain with ease. There was no tying up of trucks and men to move compressed air and tools to the spot. Tractair, with its 125 cfm capacity, took care of the whole operation. And the savings to the contractor were substantial.

The versatility of Tractair, since it is a combination 42-hp wheel tractor and 125-cfm compressor, can save you money, too. You can use it for drilling, tamping, driving form pins, breaking pavement, and a host of "odds and ends" jobs. Write for complete details.

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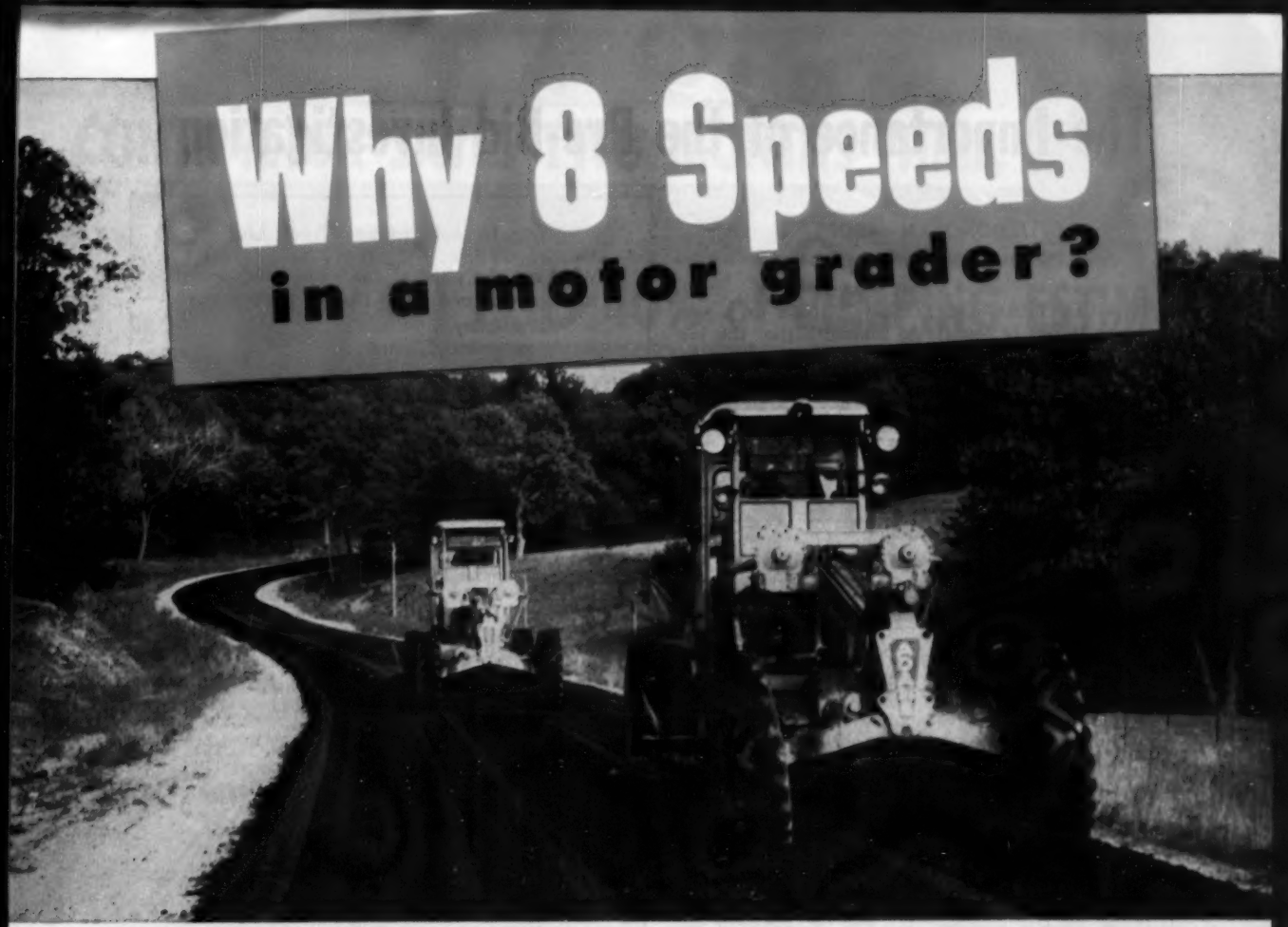

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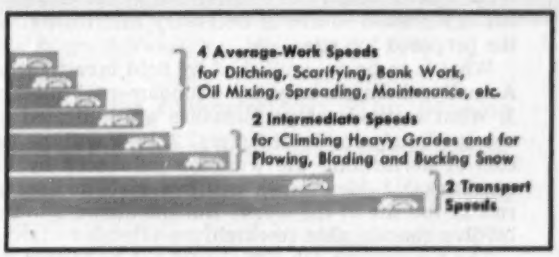
Other important advantages that make Adams Motor Graders your best buy include: 4 reverse speeds—optional creeper speeds (low as ¼ mph.)—easy-shifting, constant-mesh transmission—rubber-mounted engine—dual braking system . . . Available in 4 models, from 75 to 140 hp . . . Don't buy any motor grader until you investigate Adams—the most advanced line on the market.



ADAMS 8 FORWARD SPEEDS

Adams Motor Graders give you 2 more forward speeds than most graders—8 instead of 6. These additional speeds give you an extra working speed—4 instead of 3—and a higher "high"—up to 25 mph.—for getting to and from the job.

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Make your next motor grader an **ADAMS**

The Importance of the Pre-Bid Investigation

By J. DONOVAN JACOBS
Chief Engineer, Kaiser-Walsh-Perini Raymond*

WHEN A CONTRACTOR LOSES MONEY on a job, one of two things is usually to blame: Either the job has been ineptly managed, or it has been bid too low. Frequent analysis of costs can usually spot mismanagement early enough to put a contractor on his guard before too much damage has been done. But when a job loses money because the bid price is too low, he can do little except make the best of a bad situation . . . and resolve to be more careful next time.

It is easy to point to such things as bad weather or the unsympathetic attitude of labor when a job goes sour, but these conditions could have been — and should have been — considered in the original bid. Perhaps unfavorable weather conditions could have been anticipated had a more careful study been made of local weather records. Or perhaps labor trouble could have been avoided if local labor officials had been sought out and consulted before the job was bid.

To say that a contract lost money because of unforeseen conditions is often only a face-saving way of saying that the bid price was too low because of insufficient investigation of probable cost factors.

An accurate pre-bid estimate is a step-by-step construction of the proposed job on paper, with an economic evaluation of each step based on knowledge of factors likely to influence the cost of each operation. Imagination is a useful gift when devising methods and plans for construction, but for preparing a bid estimate it is a dangerous substitute for knowledge of the facts.

The estimator must acquaint himself with job conditions as completely as time will permit. Although a lot of known detail can be analyzed in the estimator's office, his main source of necessary information is at the proposed job site.

What is to be accomplished by field investigations? Actually, there are only three fundamental questions: 1. What methods of performance are indicated as a result of analyzing local factors? 2. How will the labor cost of performing the work be influenced by local conditions? 3. How much will materials and services cost at the site of the work? But the answers to these involve considerable research.

The prospective job site should not be visited until the investigator knows the details of the proposed work, its scope and possible difficulties. A fast and frantic perusal of the plans and specifications while traveling to the site is a poor substitute for several days of study, briefing and discussion before embarking on the first exploratory visit. Considerable prior thought should have been given to methods of accomplishment which must be decided before operating costs can be computed.

Because the owner seldom allows the contractor adequate time to prepare a construction bid, plans must be obtained early and a time schedule made for the preparation of the estimate and bid. Office studies, including takeoffs and drafting room work, can be carried on simultaneously with the field research. But office and site work must be coordinated intelligently so that they will dovetail smoothly in the final stages of estimate preparation.

Field inspections should be made by both the estimator, and, if he is known or available, the superintendent who will run the job, if obtained. Perhaps these two will be the same person. The number of people comprising the inspection party will depend upon the size and importance of the prospective job.

It should be stated at this point that if the boss wishes to make the inspection trip, it is seldom advisable to object. He is usually curious about a job on which he is going to gamble his money. But it must be remembered that his curiosity is usually satisfied after a few hours on the site. If, after the first day of

Site Investigation Check List

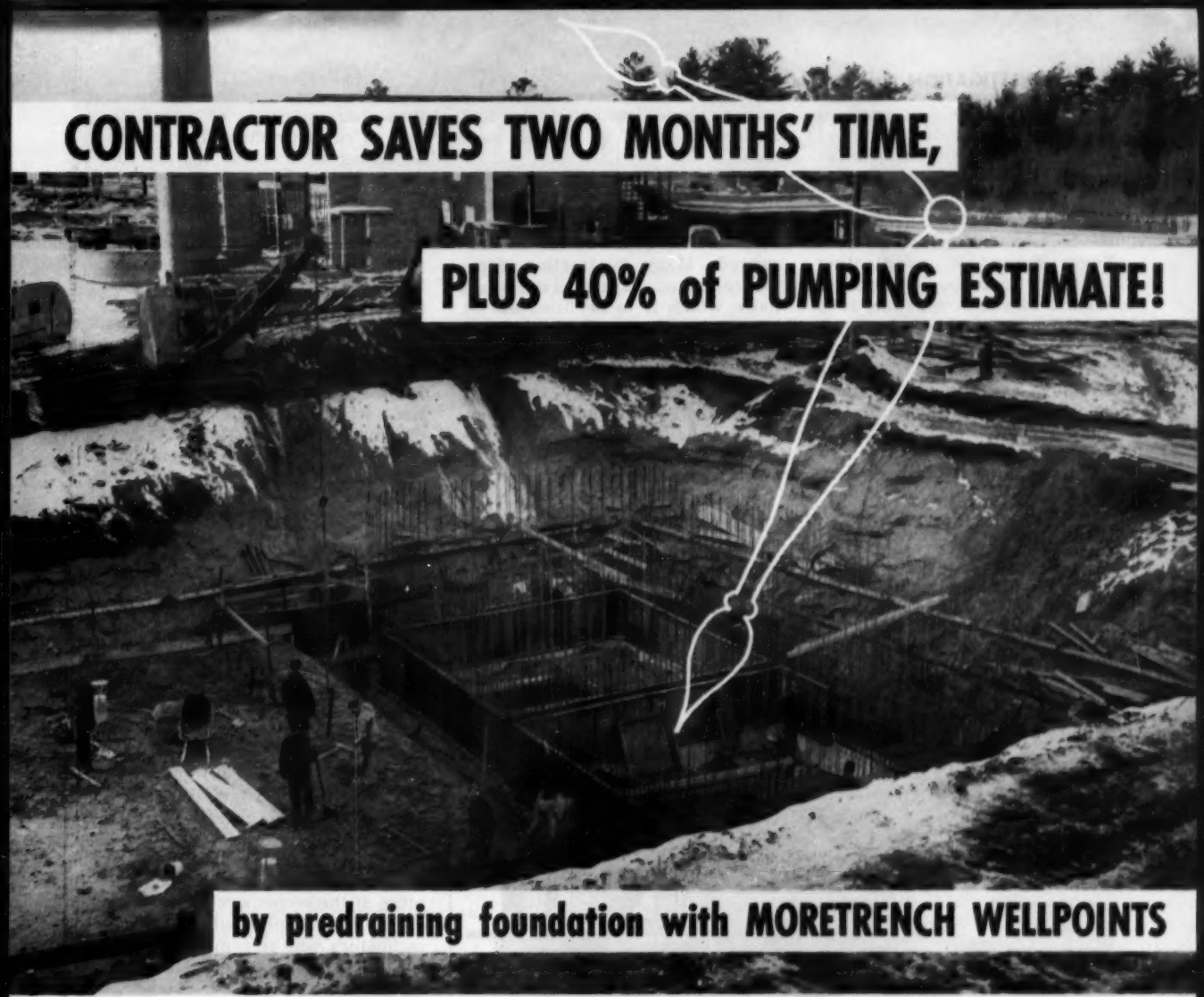
1. What are the physical conditions which will dictate methods and affect time of performance?
   - Accessibility
   - Weather and Climate
   - Topography
   - Hydrology
   - Geology
   - Access Facilities
   - Preparatory Work
   - Transportation and Communication Facilities
2. How will cost of labor be affected by local conditions?
   - Prevailing rates
   - Possibility of increase in rates
   - Availability of labor
   - Transportation and recruiting costs
   - Necessity of using overtime as an inducement
   - Possibility of labor strife
   - Cost of housing and boarding if necessary
3. What will be the cost of materials and services?

Permanent Materials	Transportation
Supplies	Communication
Subcontracts	Insurance
Utilities	Taxes

*A joint venture on the Eucumbene-Tumut Tunnel and Dam for Australia's Snowy Mountain Development. Joint ventures are: Kaiser Engineers (sponsor), Walsh Construction Co., B. Perini & Sons Inc., R.C.P. Construction Co. Ltd., Bates & Rogers Construction Corp., General Construction Co., Arthur A. Johnson Corp.

CONTRACTOR SAVES TWO MONTHS' TIME,

PLUS 40% of PUMPING ESTIMATE!



by predraining foundation with MORETRENCH WELLPOINTS

Sewage Treatment Plant, Merrill, Wis.— Contractor: Burger & Vicker, Inc., Wausau

Before ordering pumping equipment for this job, Burger & Vicker, Inc. tested two wellpoints—*in the ground*—Moretrench and another make of wellpoint which they had been using for several years.

The MORETRENCH Wellpoint pumped 25% *more* water than the other.

That did it! Moretrench got the order. Results were immediate—and perfect. 21′ of water disappeared fast.

Here's what the contractor says: "Our pumping estimate on this job was based on our former experience with wellpoints. Using Moretrench, we finished the job *two* months earlier than anticipated at 40% less cost!"

Exceptional? No! For a time and money saver on any wet job, you can't beat a MORETRENCH WELLPOINT SYSTEM. For full details on how to pump—at a profit—contact our nearest office.

MORETRENCH CORPORATION

90 West St. New York 6 | 4900 S. Austin Ave. Chicago 38, Illinois | 7701 Interbay Blvd. Tampa 9, Florida | 315 W. 25th St. Houston 8, Texas | Rockaway New Jersey

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Canadian Representative: Geo. W. CROTHERS Limited, Toronto, Ontario

looking, he suggests that business matters require his return next morning to the office, the estimators should bid him adieu, but stay themselves to finish the exploratory tasks which as yet are hardly begun.

Never hurry an investigating visit. In order to be in complete command of your own time, it is better to travel in your own or a rented car. Then you will not be placed in the possibly restrictive situation of accepting guide services from a salesman friend or engineering representative of the owner, whose time you do not feel as free to spend as you do your own.

If you have properly prepared for your trip, you will arrive at the site equipped with a memorandum list of questions to be answered. Many contracting firms utilize a standard printed questionnaire which is to be filled out at the job location. Such a form will contain spaces for recording relevant information: weather and hydrological data, geology, transportation distances, communications, sources of supply, labor rates, utilities charges, prices of materials, lists of subcontractors, names and addresses of owners' representatives, competitive jobs in progress in the vicinity, housing facilities, labor union information, etc.

Such a system is useful as a reminder, but there is the danger that by its routine use, a job investigation may become too formulized. No job ever follows a standardized pattern. An estimator must always be on the alert to discover the existence of those factors or conditions which make the project under consideration dissimilar to any others which have ever been conceived.

Let's assume you are to make a pre-bidding investigation of an earthfill dam. You are conversant with the job from having studied the plans and specifications. Your questions have been recorded. Many of those questions will answer themselves as the studies progress. Others will be answered verbally by the owner's representative at the site. The remaining ones are of such importance that a letter must be directed to the contracting agency for written clarification. The important thing is to make sure that all uncertainties are resolved.

You arrive at the site. In need of guide service, you call at the office of the owner's representative or resident engineer, who either accompanies you or commits you to the care of his official show-er-

around, and you're away. You spend the remainder of the day driving over various unimproved trails to look at borrow areas, spillway location, cutoff wall, diversion tunnel portals and whatnot—all the while attempting to memorize the multitudinous details which have been observed and statements

(Continued on page 107)

THIS + THIS =

Low Cost Concrete Maintenance and Restoration

The AIRPLACO portable rig cuts concrete restoration and maintenance costs. This completely mobile unit is made up of the AIRPLACO Bondactor or Nucretor and the AIRPLACO Mix Elvator. It eliminates many man-hours and saves on material costs. Aggregates are proportioned, mixed, elevated and deposited in the Bondactor by the Mix Elvator.

The Bondactor or Nucretor and the Mix Elvator are available as separate pieces of equipment. AIRPLACO concrete gunning equipment is available with capacities from ½ to 6 cubic yards of aggregate per hour.

Write today for complete information. State intended use and capacity desired.

AIRPLACO AIR PLACEMENT EQUIPMENT CO.
1010 WEST 24TH ST. • KANSAS CITY 8, MO.
MANUFACTURERS OF ADVANCED DESIGN CONCRETE GUNNING EQUIPMENT

"WE'VE NEVER HAD AN ENGINE FAILURE DUE TO THE OIL"

George Pennington, Equipment Superintendent of the J. A. Tobin Construction Company, Kansas City, Kansas

This DW 21 Cat moves more than 600 yards of dirt per day . . . The crankcase holds 8¼ gallons of Phillips *66* Super HD Motor Oil.

EQUIPMENT SUPERINTENDENT George Pennington of the J. A. Tobin Construction Company is now keeping the Tobin units on the job just outside of Kansas City, where the company is extending Kansas Highway 69. Says he: "I'd say paving work is the hardest test for an engine. You have the strain of heavy loads and knee-high dirt plus the fact your equipment is constantly under a cloud of concrete dust." And Mr. Pennington has a world of experience to back up his statements; he has been in the business for over 20 years.

Phillips *66* Heavy Duty Motor Oils are doing their share in keeping the Tobin equipment in the field. These oils are used exclusively in the Tobin machinery. They are used to protect trucks, DW 10 and DW 21 Cats, Pushers, Scrapers, Graders, Road Pavers and Scoops. George Pennington speaks right out: "We've been using Phillips oils for years—settled on your oil because we found it completely dependable. To tell the truth, we've never had an engine failure due to the oil."

Test Phillips *66* Heavy Duty Motor Oils against the oil you are now using. A Phillips *66* Lubrication Engineer will be glad to help you set up a test. Write to: Sales Department, Phillips Petroleum Company, Bartlesville, Oklahoma.

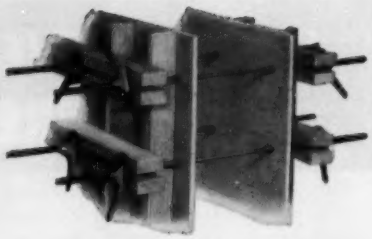
It's Performance That Counts!

Phillips 66

PHILLIPS 66 HEAVY DUTY MOTOR OILS

SUPERIOR

All the Accessories For Dependable Concrete Forming!

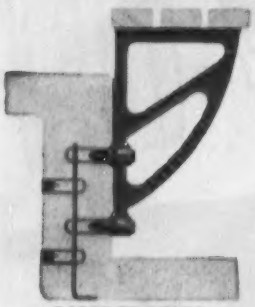


TILT LOCK CLAMPS

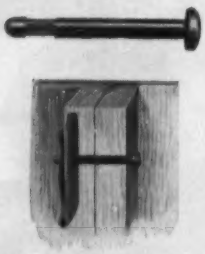
SNAP TIES

STANDARD COIL TIES

CONE-FAST COIL TIES



RISERFRAMES



PANEL LOCK BOLTS

ROD CLAMPS

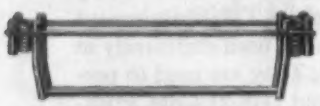
COIL LOOPS

SCREW ANCHORS AND BOLTS

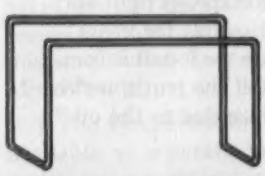
STANDARD HANGER FRAMES

ADJUSTABLE SCREED CHAIRS

"PICK-UP" INSERTS FOR TILT-UP SLABS



SPECIAL HANGER FRAMES



WIRE BEAM SADDLES

Shown here are some of the many types of Form Ties, Anchors, and other concrete accessories which SUPERIOR'S years of engineering and field experience plus manufacturing dependability have developed and produced.

Every item in the SUPERIOR line is specifically designed to provide the most dependable and efficient forming method for ordinary foundations, engineering structures, watertight walls and architectural concrete.

When you plan form work, SUPERIOR'S experienced engineers are available to prepare suggested layouts of form work as well as complete estimates and quotations.

For details request copy of our COMPLETE CATALOG

SUPERIOR CONCRETE ACCESSORIES, INC.

4110 Wrightwood Avenue, Chicago 39, Illinois

New York Office: 1775 Broadway, New York 19, N. Y.

Pacific Coast Plant: 2100 Williams St., San Leandro, Calif.

which have been made during the trip.

You have probably scribbled notes galore and, if you are a picture-taker, you have exposed several batches of film. Photographs of prospective work areas are well worth-while, both to bolster the memory of the taker and to illustrate conditions to others who have not been there. But don't waste time taking snapshots if the prints cannot be processed and obtained soon enough to be of use in making the estimate.

Just the Beginning

You complete your first intensified day of ground-looking and fact-gathering. You have a huge amount of information loosely stacked in your mind, and it needs a lot of sorting and packaging before using. You probably return to the hotel so late in the day that you barely have time enough for two drinks at the bar before the dining room closes. Many investigating teams mistakenly consider their field work now completed and prepare to head homeward. Actually, at this state, the investigation is only started.

If the time is available, the day following the first inspection trip can profitably be spent reviewing the plans and specifications and working on methods for doing the job. Many new ideas and conceptions will have appeared as a result of the first "getting acquainted" visit. The second day should be a period for chewing and digesting the material harvested the day before. It will undoubtedly reveal a few informational gaps.

On the third day, go back over the work area. This time you will have a more enlightened conception of the project and its ramifications. You realize that you are just beginning to discover a few of its most significant features. This time you will wear out some boot soles. One cannot get the feel of a construction endeavor by observing it from the interior of a comfortable sedan, nor from flying over the terrain in an airplane. If you possess the attributes of a true construction man, you will clamber the hills and probe the depths afoot.

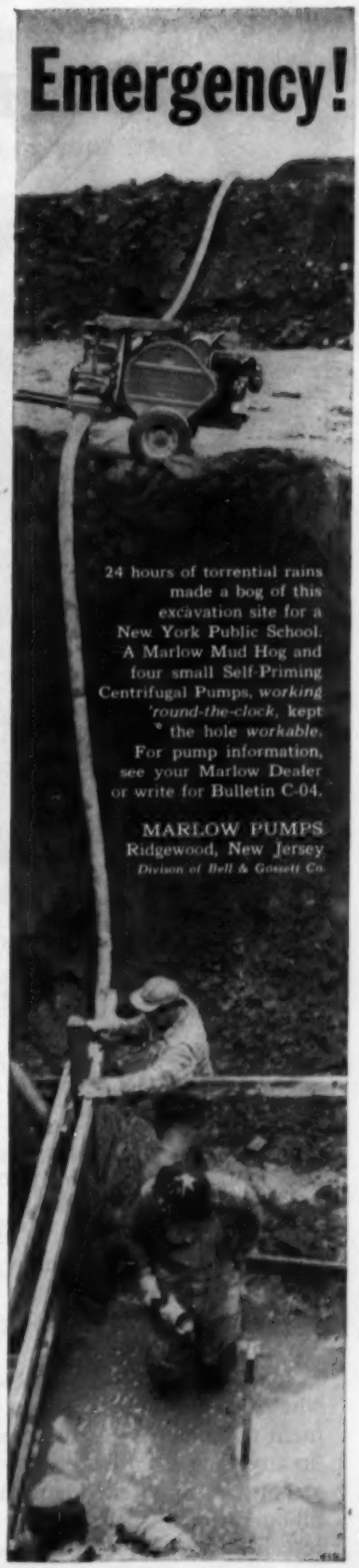
Sometimes the surface inspection of the job site reveals the desirability of more specific (and usually expensive) explorations such as drilling, testing of aggregates, or geological studies. Such information should have been developed and provided by the owner or engineering agency but is frequently omitted. Naturally, a bidder is loath to add to the considerable expense which he has incurred by undertaking to bid the job. The cost of such supplemental investigations should be weighed against the possible loss which might result from a wrong guess.

Governmental Help

The investigator must not overlook the possibility of obtaining valuable data from easily available governmental publications. Geological survey maps, as well as those of the Coast and Geodetic Survey, are available for a considerable portion of the United States. States maintain departments of mines, water resources, geology, etc., the staffs of which will usually be cooperative in digging out information. Don't overlook the Weather Bureau reports for the region. Often it will be discovered that climatological data extending back for many years has been compiled for a near-by station.

When the prospective work is in unfamiliar territory, it is wise to invest the time required to become thoroughly acquainted with all local conditions. Dependable word-of-mouth information can usually be gathered from individuals whose livelihood has required them to know the locality intimately. These include lumbermen, surveyors and farmers. If a retired county engineer can be tracked down, the kindred-spirit feeling will usually result in useful facts. Seek out old settlers and invite their comments. But in evaluating any conversa-

(Continued on page 110)


Emergency!
24 hours of torrential rains made a bog of this excavation site for a New York Public School. A Marlow Mud Hog and four small Self-Priming Centrifugal Pumps, *working 'round-the-clock*, kept the hole *workable*. For pump information, see your Marlow Dealer or write for Bulletin C-04.
MARLOW PUMPS
Ridgewood, New Jersey
Division of Bell & Gossett Co.

How to Do It with the New "4-in-1"

FOR BULLDOZING, CLAM IS OPEN and back of bucket becomes dozer blade, as shown by bucket control cylinder at left. With both blade and Skid-Shoes on ground, depth of cut is accurately and easily controlled by forward and backward pitch of dozer blade over the Skid-Shoes.

HERE'S A MONEY-SAVING BULLCLAM: new "4-in-1" digs the trench . . . spreads and compacts the refuse . . . transports, spreads, and compacts the fill . . . it's a one-man sanitation squad! And the new "4-in-1" can do dozens of other jobs around town.

New INTERNATIONAL DROTT "4-in-1" Does 4 Different Jobs at the Touch of a Hand . . .

This new INTERNATIONAL DROTT "4-in-1" Skid-Shovel on INTERNATIONAL TD-6 and TD-9 crawlers gives contractors and municipalities a whole new idea of what one man and one tractor can do!

Take a good long look—you've never seen anything like this before!

This versatile "4-in-1" Skid-Shovel is just what its name implies. Just a slight hand movement on the control gives you a unit that can do anything from loading to dozing and finish grading or unmatched performance in sanitary fill operations. Just shift the hydraulic-control rod to any of the four positions and your "4-in-1" is ready to use as a Skid-Shovel, a Bulldozer, a Bullclam, or a Clamshell. The big pictures show you. It's that simple.

And remember—all of these operations are done right from the operator's seat with one set of controls—without changing a single pin—while the crawler is moving or standing still.

Get the full story on what this new "4-in-1" can do for you—call your INTERNATIONAL Industrial Power Distributor for your demonstration right away.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS
DROTT MANUFACTURING CORP., MILWAUKEE 8, WISCONSIN

Skid-Shovel — Bulldozer — Bullclam — Clamshell

NEW INTERNATIONAL DROTT "4-in-1" does all 4 jobs — changes blade positions hydraulically in seconds — at the touch of your hand.

3. SKID-SHOVEL

IN SKID-SHOVEL POSITION, "4-in-1" uses exclusive Skid-Shoes to give 300% greater break-out force than similar-sized competitive units . . . retains heaped loads with 41° bucket roll-back at ground level . . . skids bigger payloads.

4. CLAMSHELL

NEW "4-IN-1" USED AS A CLAMSHELL is ideal for loading from stockpiles or from loose material in close quarters. Hydraulically operated clam opens wide for big load. Bucket can be rolled back 41° and semi-skidded when fully loaded. Note bucket control cylinder fully closed.

THE NEW "4-IN-1" CATALOG FREE

For your free copy of the "4-in-1" Skid-Shovel catalog, fill out the coupon and mail it today.

Drott Manufacturing Corp.
3841 W. Wisconsin Ave.
Milwaukee 8, Wisconsin

Gentlemen:
Please send me a copy of the "4-in-1" Skid-Shovel catalog to

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INTERNATIONAL® DROTT

INTERNATIONAL HARVESTER

PRE-BID INVESTIGATION . . . Continued from page 107

tional facts, remember that the passage of years often adds color to recollected events.

Make it a point to seek out labor union representatives in the area: Their business is to know local labor conditions. And recognize that the opinion of the union official is probably as biased as your own. Frank and friendly discussions of labor prospects will usually reveal the attitude with which an employer will ultimately have to contend. Besides talking to the labor union men, be sure to call upon representatives of the local construction employers organization, if such exists. The secretary of the local AGC chapter can, and probably will, give you his view of labor problems. The purpose of these labor discussions is to form conclusive opinions regarding the availability of labor, its quality, wage rates to be paid, and potential conditions of labor strife and unrest.

Materials and invoices are a major part of the cost of any construction. As discussed here, materials are all job costs which are not properly classified as labor. They would include such costs as subcontracts, power and taxes on property. When a prospective job is in a region unfamiliar to the contractor an analysis of the availability, sources and costs of materials becomes an important part of the pre-bid investigation.

It may be necessary to station at the job or bidding location one or more members of the estimating staff to canvass and receive quotations from vendors and subcontractors. Such an employee will not fulfill his task properly by merely being "in residence." He must actively seek out sources and request quotations. As every contractor well knows, a job can be carefully and correctly estimated in all other respects, but be overbid because the lowest quotation was not received on certain materials or subcontracts.

Don't forget to interview the

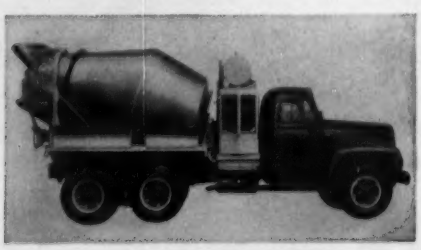
county assessor and tax collector for the purpose of promoting friendly relations, and perhaps obtaining his opinion on how valuable he may consider a tractor or

(Advertisement)

Actual picture of 1½" slump concrete coming out at BETTER THAN A YARD EVERY 15 SECONDS! Only with CMC's exclusive Swing-Out Hopper is this possible.

CMC Transcretes make and deliver better concrete faster . . .

No wonder the "big swing" is to Transcretes. They're rugged, yet lighter in weight for more payload on the road, more concrete in the forms. New chute arrangement gives complete flexibility for any kind of pour. Transcrete's exclusive floating drive eliminates troubles experienced with ordinary rigid drives and has the simplest chain take-up ever.



3½ to 6 Yard Capacities

Write for New Bulletin

TM 1055

CONSTRUCTION MACHINERY COMPANY

Waterloo, Iowa

Now built by LIMA...the portable, 3/4 - swing, extra-output BADGER

LIMA is proud to be able to offer the fast-moving, fast-working BADGER as part of the standard LIMA line of quality-built machines. This highly portable, hard-working, ruggedly built ½ yard shovel is easily convertible for use as a trench hoe, clamshell, dragline, pile-driver, crane or skimmer. Available with gasoline, Diesel or electric power, the BADGER has proved on the toughest jobs that it's the fastest, most dependable shovel in its class.

Remember, it's as true of the BADGER as of every other machine built by LIMA.

COMPARE QUALITY! No other machine gives you as much:

1. Lighter swinging weight.
2. Greater stability.
3. Better visibility.
4. No tail swing.
5. Extra dumping height.
6. Extra reach.
7. Anti-friction bearings.
8. Easily portable.
9. Easily convertible.

It will pay you to find out how the BADGER can benefit your own operation. Contact your nearby BADGER distributor, or write today to Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA SHOVELS · CRANES · DRAGLINES · PULLSHOVELS

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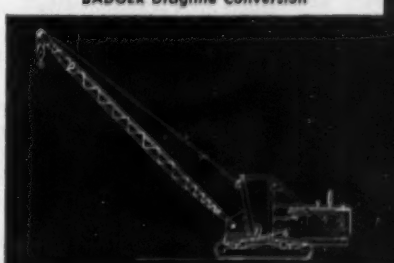
Construction Equipment Division · LIMA · OHIO · U. S. A.

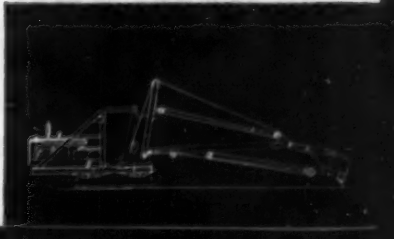
BADGER Shovel Conversion

BADGER Dragline Conversion



Above BADGER Crane Conversion

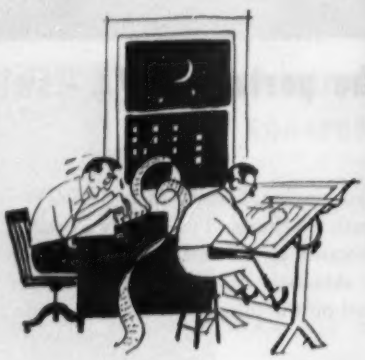
Below BADGER Trench Hoe Conversion



concrete mixer which may chance to rest within his bailiwick come tax day. And while you are worrying about tax liabilities, remember to find out about those state sales taxes and their applicability. Does the state require payment of a business or corporation tax? If the job is sufficiently large, it may be advisable to seek the advice of a qualified tax consultant regarding such liabilities.

Insurance costs are always considerable and must be ascertained before the job can be estimated with adequate precision. Probably the most important insurance cost will be Workman's Compensation premiums. Rates for this coverage vary in different states and for different occupations. Get these rates from your insurance company or broker. Before calling him, make a list of all other insurance coverages which will be required and which must be included in the cost budget. These include fire, flood, damage to construction equipment, payroll protection, contractural liability, etc.

After the ground exploration and preliminary harvest of information has been done, then come



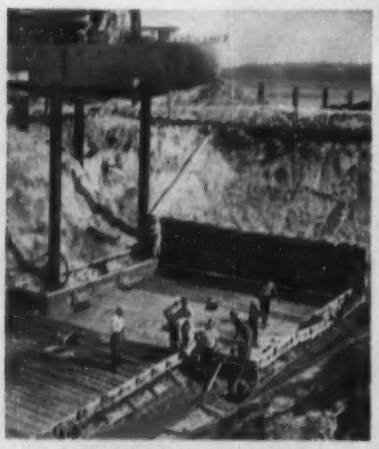
the arduous hours of labor at desk and drafting board before the figures can be added and taken upstairs. Unless remoteness of the job site from the estimating office makes it impossible to do so, the estimator should make another field inspection before finalizing his computations. The second survey will not take as long as did the original one, but many things will appear differently after a couple of weeks of discussion and analysis. In any event, the more often one examines the site, the more accurate will be his conception of the problems and difficulties of the work. A second and even a third look should be taken if practical to do so.

Did somebody say that all this touring and fact-gathering consumes too much time during the rush of bidding a job? If sufficient time or manpower is unavailable to make a thorough study of factors which will influence costs, the prudent contracting firm will refrain from bidding. To pass up bidding in such circumstances is certainly less risky than to file a bid at a figure which may be below cost as a result of having had inadequate knowledge of the job.

HOW TO HANDLE
WET JOBS

MUNICIPAL POWER
PLANT STRUCTURE
Jacksonville, Fla.

Contractor: George D. Auchter Co.



WELLPOINTS LOWER WATER
OVER 20 FT IN ONE LIFT

WHEN CONFRONTED with the problem of draining ground water to such a depth, most contractors assume that a costly 2-stage wellpoint system will be necessary. Today it is possible to avoid these costs, thanks to the development of improved new high-lift pumps (available only through Griffin).

• On the above job, for example, one such high-lift electric pump lowered the ground water from elevation 101 to elevation 80.7 in a single lift. Photo shows the bone-dry excavation, with men working 20 ft below adjacent St. John's River.

• Another feature of this job was the engineers' expert planning and placement of points, giving contractor trouble-free results in difficult soil—fine sand with layers of muck and hardpan.

GRIFFIN
WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.
In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

Wire Hanger Makes Economical Plan-Rack

A COMMON HOUSEHOLD ITEM, the wire coat hanger, can find a use around your job.

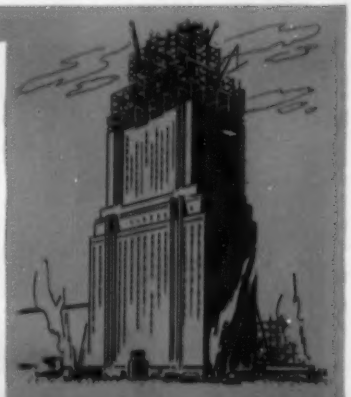
Establishing their field office in a house destined for removal by their contract on the New York State Thruway, Corbetta Construction Co. and Yonkers Contracting Co., left the hangers in the closet and hung their plans on them instead of clothing.

Breaking the contract plans down into sections, they bound the left-hand edge of the sheets between two wooden slats with small through-bolts. A wire hanger inserted over the bolts between the plans and one slat allows ready mounting on the clothes bar in one of several closets, furnishing a convenient and economically constructed plan-rack.

SKIL RADIAL SAW

...with exclusive "Retracto-Glide" arm slashes set-up and cutting time!

Now, one man with SKIL Radial Saw can keep *more* carpenters busy than ever before. With the ability to cut almost every material . . . on all construction jobs . . . SKIL is the most useful and practical radial saw you can buy.



LOOK AT THESE FEATURES:

1. **CLEAR WORK TABLE** makes it easy and fast to lay out even complicated cuts. Any angle cut may be set up in one quick step . . . with cutting head either in front or back of fence.

2. **GREATER STRENGTH AND ACCURACY**—Exclusive wide spacing of 8 grease-sealed ball bearings in the supporting head gives maximum support. Bearings have hardened steel tires ground on their own centers, traveling on hard chrome rails.

3. **CONVENIENT CONTROLS**—placed for easy adjustment from operating position.

4. **OPTIONAL ACCESSORIES** make SKIL best equipped to cut Transite, angle iron, aluminum shapes, sheet metals. You can keep SKIL Radial busy on every job.

Ask your SKIL Distributor for a demonstration of the versatile SKIL Radial Saw.

For literature and the name of your nearest distributor, write . . .

SKIL
PORTABLE TOOLS

Made only by SKIL Corporation
formerly SKILSAW, Inc.
5033 Elston Avenue, Chicago 30, Illinois
In Canada: SKILTOOLS, Ltd., Toronto 9, Ontario
Factory Branches in ALL Leading Cities

The Wonder Grease for Concrete Forms

REGARDLESS of whether you use steel or wooden forms for concrete work — you can apply Globe Form Grease by spray, brush, or swab. This time-tested paste emulsion will reduce peeling and pitting to a minimum when forms are removed, and practically eliminate patching.

Due to its special adhering qualities, Globe Form Grease requires only a thin coating for utmost effectiveness. In fact, one gallon adequately covers approximately 200 square feet! And in addition — Globe Form is stainless, leaves a whiter smoother surface, and eliminates the need for painting.

Why not write for full particulars today? Once you use Globe Form Grease, you'll understand why engineers and contractors hail it as the "wonder grease" for concrete forms.

Write for interesting literature on "Rubarite", a sensational new synthetic rubber product for rubberized asphalt paving.

OILS *and* GREASES
for every purpose
DIESEL
STEAM
AUTOMOTIVE

Write for descriptive booklet of all Borne, Scrymser products.

BORNE SCRYMSER Since 1874

Our Laboratory Facilities are always at your disposal

BORNE, SCRYMSER COMPANY ELIZABETH, N. J. • CHARLOTTE, N. C.

Cooling Unit Ups Hydraulic Performance

CLEAN, COOL hydraulic fluid not only boosts the efficiency of a front-end loader but also extends the life of its hydraulic pump, lines, and rams. Dirt can quickly wear out parts, especially in the pump, and excessive heat can cut pressure in the hydraulic system.

A good way to maintain top performance is to mount a high-pressure full-flow filter and cooling unit on the back of the loader. It not only cleans the fluid but also lowers line temperature. As an added bonus, the unit makes a good counterweight and also reduces loading shock.

A 2,000-lb model mounted on an Allis-Chalmers HD-15 loader is doing a good job for Villa Contracting Co. of Westfield, N. J. Villa's loader has tough digging all day in a gravel pit (May, p. 70). The air is dusty, and the hydraulic system is worked to capacity. But with a unit that cuts fluid temperature 100 deg, the bucket lifts and holds just as easily at the end of the day as it does in the beginning. And maintenance is kept to a minimum.

Made by Krogman Filter Co. of Long Branch, N. J., the unit consists of four filters inside a 55-gal water jacket. All hydraulic fluid is sent directly from the pump to an intake manifold at the base of the unit. The manifold distributes the fluid to the filters, where it is cleaned and cooled. An exhaust manifold carries the fluid back into the 1¼-in. lines. The unit handles 70 gal per min at a pressure of 1,350 psi. A safety valve goes into operation if the pressure passes 1,350.

Metallic-type filter elements are encased in heavy 7-in. dia cylinders with 1½-in. walls. For maximum safety, 1-in. dia bottom and top plates on the cylinders are secured with eight 1-in. studs. The tank around the four filters is 48 in. long, 14 in. wide, and 20 in. high. It has two vents on top to aid cooling.

FILTER AND COOLING UNIT mounted on rear of Allis-Chalmers HD-15 front-end loader boosts efficiency of hydraulic system. Dirt is removed and line temperature cut 100 deg.

SMALL LOADERS can also up performance with filters. Two filters are enough for HD-5 loader. No cooling unit is needed.

TOUGH DIGGING IN SAND BANK is hard on HD-15's hydraulic system. Filter unit cuts maintenance to a minimum.

THE NEW UNIVERSAL 293Q TWINDUAL PACEMAKER

combines peak production with maximum portability

TOP CAPACITY PRODUCTION

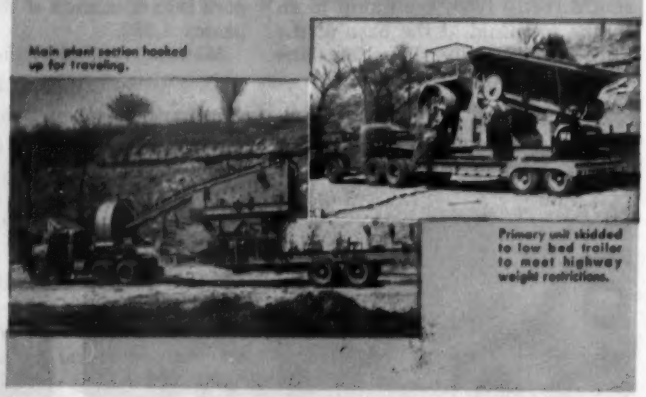
The TwinDual Pacemaker gives you three full stages of reduction for top capacity—a Universal overhead eccentric jaw crusher in the first stage and a TwinDual roll crusher for the second and third stages.

No other single unit plant offers so many big-profit advantages. Big primary jaw crusher accepts large rock—lets you work gravel pits containing big boulders. Exclusive TwinDual two-stage roll crusher gives top capacity secondary crushing. Its high ratio of reduction permits the primary jaw to operate at 50 to 100% wider discharge opening. This results in greater capacity—less jaw wear. Larger inclined gyrating screens with full screening area allow 20 to 25% greater output. All operations from apron feeder to delivery conveyor are driven through one single power unit.

For top capacity with three stages of reduction—and a bonus in longer crusher life, lower horsepower requirements and a better quality finished product, choose a Pacemaker. Available in five models for pit or quarry operation. Get complete profit making facts now.

LOW TRAVELING WEIGHT

The primary jaw crusher, apron feeder with grizzly by-pass, operator's platform and structural supports are all mounted as a single unit on skids. This primary unit is bolted to the main truck frame. When highway weight limitations must be met, this unit may be quickly skidded to a low bed trailer and transported separately.



Main plant section hooked up for traveling.

Primary unit skidded to low bed trailer to meet highway weight restrictions.

PETTIBONE UNIVERSAL
In Cedar Rapids Since 1906

UNIVERSAL ENGINEERING CORPORATION
327 8th Street, N. W., Cedar Rapids, Iowa
Subsidiary of Pettibone Mulliken Corporation, 4700 W. Division Street, Chicago 51, Illinois

POWER PACKED BY HUBER-WARCO for TOUGH JOBS

Huber-Warco Motor Graders handle all jobs efficiently and economically, with a minimum of costly "down-time" for blade adjustment on the job. The real tough jobs are a snap for the Huber-Warco Motor Graders.

Huber-Warco 4D Series Motor Graders range from 75 to 123 Horsepower. The 5D-190, with torque converter and power-shift transmission, develops 195 H.P.

CHECK THESE HUBER-WARCO FEATURES

- Completely cab-controlled blade movement, 90° either side—no manual adjustments.
- Mechanical steering with hydraulic booster.
- High front and rear axle clearance.
- Retractable scarifier permits 360° blade rotation for back-up pass.
- Easy to reach controls.
- Wheels and tires are completely interchangeable.

For Complete Details — See Your Huber-Warco Distributor

HUBER W WARCO

HUBER-WARCO COMPANY

MARION, OHIO, U. S. A.

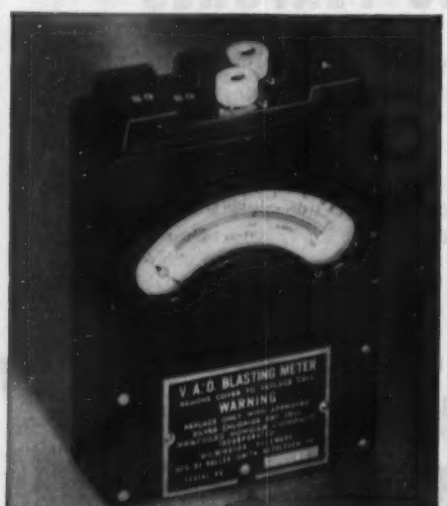
Road Machinery

CABLE ADDRESS: HUBARCO

ROAD ROLLERS • MOTOR GRADERS • MAINTAINERS • GRINDERS

HIGH CAPACITY, YET PORTABLE—The Titan Blaster is housed in a rugged aluminum case and is waterproof.

NEW HERCULES TITAN BLASTER



THREE-IN-ONE—The V.A.O. meter, available through Hercules, is a combination voltmeter, ammeter, and blasting galvanometer that has proved its value in field use as an important blasting aid.

For Maximum Safety, Economy

The Hercules Titan® Blaster is a high-capacity, condenser discharge type of blaster that combines maximum safety with minimum maintenance expense.

The Titan Blaster has no moving parts. It is operated by depressing two push-button switches—one to charge and one to fire. This new Hercules blaster develops sufficient electrical energy to fire as many as 1,200 detonators. Yet, there is no high voltage associated with the Titan Blaster except during charge and firing. The source of energy is a relatively inexpensive 6 volt, dry cell ignition-type battery.

For full technical details on the Titan Blaster, write:

HERCULES POWDER COMPANY
INCORPORATED
Explosives Dept., 974 Market St., Wilmington 99, Del.

XBSS-7

FIBERGLAS INSULATION 1½ in. thick faced with reinforced aluminum foil is laid on purlins and covered with metal roofing.

FASTENERS, called Metltabs, are applied over purlins. The fluted center of the tab fits between joints of insulation material.

AFTER THE METLTABS ARE IN PLACE the roof sheet is bolted to the purlins. The tabs also assist in supporting insulation.

ONCE THE ROOF SHEETS are bolted together they form a continuous sheet from ridge to eave, resulting in a tight vapor seal.

Flute-Type Fasteners Make Snug Vapor Seal

A NEW TYPE OF FASTENER holds insulation to the roof of Owens-Corning Fiberglas Corporation's new warehouse addition in Kansas City, Kan. The tabs also cover the joints between the strips of foil-faced roll insulation to make a tight vapor seal that reduces condensation to a minimum. The manufacturer (Metltab Co., Buffalo, N. Y.) claims its Metltabs reduce by about one-half the time required for similar installation by conventional methods.

Metltabs are galvanized metal strips stamped with a lengthwise centered flute to fit up into the corrugation recess where metal roof sheets are lapped. They are cut to span between purlins and are 3 or 3¼ in. wide.

On the 230x300-ft Kansas City structure, 1½-in. Fiberglas insulation faced with reinforced aluminum foil was applied over the purlins and covered by metal roofing. Metltabs were then set on the purlins to cover the underside of the joints between adjacent strips of roll insulation. The fluted stamping fitted into the roof sheet corrugation, resulting in a tight vapor seal and overlapped by 1½ in. the facing on each side of the insulation joint. Finally, the roof sheets were bolted to the purlins. *(Continued on page 122)*

MEMO:

Here's how to get the capacity and flexibility to handle a wider variety of contracts

It's pretty hard to beat a Cedarapids Commander for high daily tonnage and economical performance . . . especially if your job requires big volumes of finer sizes, or if you're working a pit with a high percentage of fines. The Commander, with its big 30" x 25" roll crusher and large screen, was specifically designed to increase output on such jobs, yet it has proved highly versatile for handling a wide variety of conditions while hanging up production records of 200, 300 and 400 or more tons per hour!

Start with a CEDARAPIDS COMMANDER

add a PORTABLE PRIMARY with VIBRATING GRIZZLY to turn 100% of pit-run material into specification aggregate

With a Cedarapids Portable Primary to handle the heavy crushing load ahead of your Commander, you can turn *all* the pit-run material . . . even big boulders . . . into specification product. You can re-open pits previously considered exhausted, open up new deposits that were considered unworkable because of oversize, or move into quarries close to your job. You'll have the capacity and flexibility to handle a wider range of profitable contracts.

And to step up production still more, be sure your Portable Primary is equipped with a Vibrating Grizzly. Located between the feeder and the crusher, it by-passes fines and undersize material *before* they reach the crusher. Wet, sticky material is easier to handle, output of the primary crusher is increased up to 25%, and maintenance costs per ton of finished product are reduced. With this set-up ahead of your Commander, you'll have a plant that can't be outproduced in any pit or quarry!

add a PORTABLE DOUBLE IMPELLER IMPACT BREAKER for big-volume rock crushing operations

Used as a Portable Primary, the Cedarapids Double Impeller Impact Breaker gives you high capacity production of desirable cubical shaped aggregate or road rock at low cost, under normal or adverse conditions. The extremely high ratio of reduction, reducing rock from 36" x 45" in size down to 1½" minus in one pass, plus the breaking of rock against rock in suspension, assures high tonnages with low maintenance.

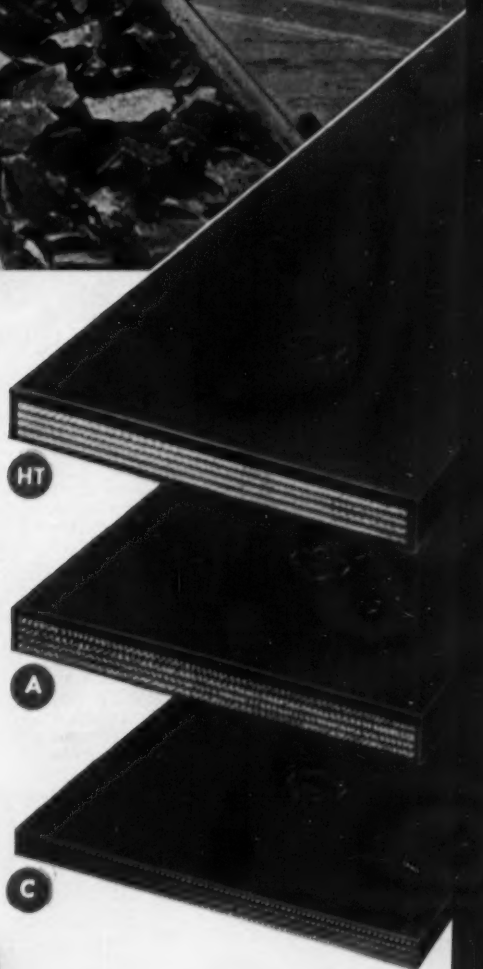
IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U. S. A.

Thermoid Conveyor Belting cuts handling costs on every construction job

There's a Thermoid Conveyor Belt designed to lower your handling costs on every construction job. Here are three examples: HT For extremely abrasive materials such as granite, trap rock, flint rock, quartz ore; A For slag, lime rock, crushed stone and other highly abrasive materials; C For moderate abrasives such as sand, loam, soda, gravel.

Thermoid's exclusive impregnation process welds carcass and cover into an exceptionally strong, durable belt. Finest quality reinforcement and specially compounded rubber stocks assure long life . . . lower your handling costs per ton. There is a complete line of Thermoid Conveyor Belting, Hose and Multi-V Belts for every construction application. Call your Thermoid Distributor for information, or write direct.



Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Thermoid

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

HOW TO RUB or GRIND CONCRETE

Today, more and more builders specify a fine finish for concrete walls and ceilings. Because of this new requirement, and of the time and expense involved for hand finishing large areas, Stow Manufacturing Company has developed two, easily portable flexible shaft grinders for finishing concrete. These grinders are electrically powered.

Two methods are used to smooth off hardened concrete: wet rubbing and dry grinding. *Wet Rubbing* — required for smoothing green concrete to a plaster-like finish. Use slow speed grinding wheel or disc. Apply water while grinding. Wet concrete can also be painted on with a brush, then smoothed into holes with the grinding wheel. *Dry Grinding*—use a high speed grinding wheel or abrasive disc to smooth dry concrete.

Either of Stow's portable, electric grinders, the ½ HP model G40-C or the ¾ HP model JT-50, can be used for wet or dry grinding. Both models are available with open or totally enclosed motors, and are equipped with 8 or 12-ft. flexible shafts. Angle heads with different speed ratios can be selected. Write for STOW'S pamphlet, *Grinding Concrete* for complete information on proper speeds, grinding discs and wheels for both wet and dry concrete finishing. Stow Manufacturing Co., Binghamton, N. Y. also makes a complete line of concrete vibrators, rotary trowels, and screeds.

STOW MANUFACTURING CO.
31 Shear St., Binghamton, N. Y.

Please send me your pamphlet, GRINDING CONCRETE.

Name .....Title.....

Company .....

City .....Zone....State.....

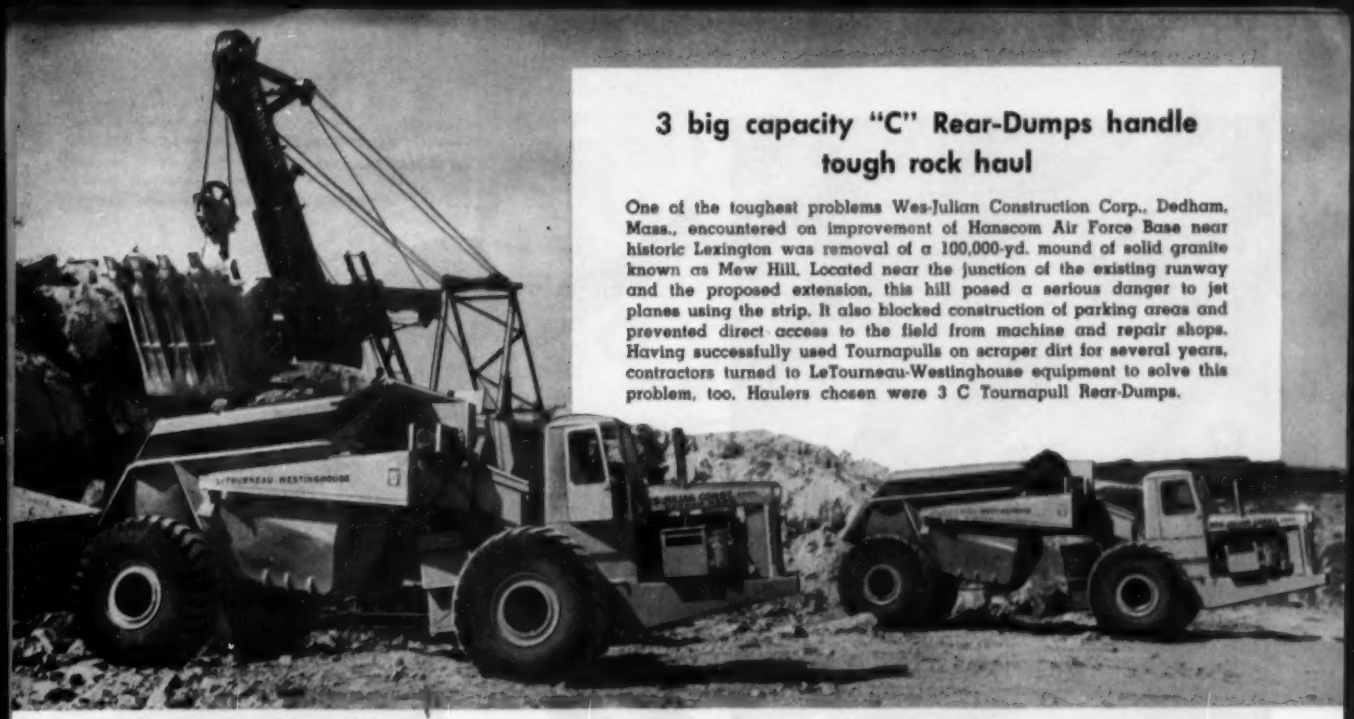
FLUTE FASTENERS . . . Continued from page 119

COMPLETED JOB presents a pleasing, pillow-like appearance from underneath. Use of the Metltabs, it is claimed, reduces by one-half the time required for similar installations.

The method is said to improve the efficiency of the over-all installation because all through metal contacts are eliminated except for fastening bolts. If roof repairs are needed later on, the Metltabs can be easily removed and replaced without loss of insulation material. The tabs can be used equally as well with aluminum foil, vinyl or any other type of standard facing.

Crane Mounted on Gooseneck Makes Trailer Self-Loading

LOW-BED TRAILERS make excellent material carriers on construction jobs—if you don't have to tie up expensive labor and equipment forces to load and unload them. Savin Construction Co. of East Hartford, Conn., solved the problem by mounting a Hopto crane on the gooseneck of one of his Fruehauf trailers. With a reach of about 25 ft, a 200-deg side swing, and a 1-ton capacity, the hydraulically operated crane can easily handle most materials on the job. Road forms, lumber curbs, and reinforcing bars are loaded in a matter of minutes. The crane is self-powered.



3 big capacity "C" Rear-Dumps handle tough rock haul

One of the toughest problems Wes-Julian Construction Corp., Dedham, Mass., encountered on improvement of Hanscom Air Force Base near historic Lexington was removal of a 100,000-yd. mound of solid granite known as Mew Hill. Located near the junction of the existing runway and the proposed extension, this hill posed a serious danger to jet planes using the strip. It also blocked construction of parking areas and prevented direct access to the field from machine and repair shops. Having successfully used Tournapulls on scraper dirt for several years, contractors turned to LeTourneau-Westinghouse equipment to solve this problem, too. Haulers chosen were 3 C Tournapull Rear-Dumps.

Solving a rock hill problem on $3,885,000 Air Base job

Rear-Dumps usually were loaded in 4 to 5 passes of 2½-yd. Northwest shovel. Each load averaged 18 tons. Because one "C" carried as much as could 3 to 4 average dump trucks, often used on jobs like this, Wes-Julian needed fewer haulers and fewer operators. All-steel body construction also reduced maintenance. Capacity of this Model "C" Rear-Dump, without sideboards, is 18 tons. Newest "C's" carry 22 tons.

Leaving the shovel, these Rear-Dumps accelerate quickly . . . go rapidly over both well-maintained haul road and soft fill. Runway is being extended 2300'. Pavement will be 200' wide with 200' shoulders on either side. Several 75' wide taxiways to be constructed include one 1000' long and another 1500' long. At the eastern end of the 150 acre air field job, Wes-Julian will also construct a 250' long blast pad.

Fill is dumped at end of runway extension. Note how body swings below and behind rear wheels. This keeps material from piling under unit . . . combined with front-wheel drive, allows safe dump over edge of fill or steep banks when necessary. When Mew Hill has been leveled, Rear-Dumps will haul another 100,000 yds. of rock, hardpan, peat, and clay from other borrow locations to grade for 6 miles of connecting highways.

Turning to dump in tight quarters of this ditch is no problem for C Tournapull Rear-Dump. Despite overall length of 29', "C's" can make non-stop 180° turn in space only 27' wide. In dump position, this remarkable unit requires only 21' for a non-stop U-turn. Steer works independently of footing through geared kingpin that connects trailing unit with prime-mover.

Tournapull—Trademark Reg. U.S. Pat. Off. R-746 H-b

For more information on Tournapull Rear-Dumps (or interchangeable scrapers and bottom-dumps) please write or call:

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

To reduce the danger from slides, rock formations like this can be bolted economically with Bethlehem Rock Anchor Bolts.

Worried About Rock Slides?

Many a rock slide can be prevented by using Bethlehem Rock Anchor Bolts at potential danger points.

Bethlehem Rock Anchor Bolts minimize the danger of rock slides because they reinforce the rock formation, preventing boulders or layers of rock from sliding or falling. They are ideal to use in cuts with high banks, or in steep hillsides, and are highly effective where the formations which they anchor in turn support overlying strata and earth.

Bethlehem Rock Anchor Bolts are made in lengths of from 2 ft to 10 ft. One end of the bolt has 5 in. of 1-in. rolled threads. The opposite end contains a 6-in. forged slot.

In installing the bolt, a 1¼-in. diam hole is drilled about 3 in. less than the length of the bolt. A wedge is started in the slot, then the bolt is inserted in the hole, after which it is driven to refusal. A dolly protects threads from damage. Driving action forces wedge deep into slot, spreading bolt-end so that it locks against sides of hole.

Bethlehem Rock Anchor Bolts come with an American Standard square nut. Depending upon the type of strata, they can be used in combination with rock-anchor plates or ties, or angle washers.

We have an interesting two-color booklet on rock anchor bolts. Write to the nearest Bethlehem office for your copy.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM ROCK ANCHOR BOLTS

Tournatractor and shovel position and hold giant boulder while electric hoist brings back Rear-Dump body to haul position. Big low-pressure tires of tractor do no damage to existing pavement. Dozer's high blade lift (54") and fast positioning help speed loading.

How Contractor Heintz beat the boulder problem...

On toughest section of Portland-Salem Expressway, extensive beds of 3 to 6-yd. boulders removed by combination of tractor, rear-dumps, and shovel

"You have the toughest section of all..."

R. A. Heintz Construction Company, Portland, Oregon, heard that phrase often during their work on 6.9 miles of the Portland-Salem Expressway between Boone's Ferry Road and the Willamette River.

Not that the grading in their $663,000 contract for turning 2 lanes of existing highway into 4 lanes of expressway involved much dirt. It didn't. Only 200,000 yards, with most cuts less than 5 ft. deep.

But in many places extensive beds of boulders had to be moved. These averaged 3 cubic yards to 6 cubic yards and 12,000 lbs. to 24,000 lbs. each. The "awkward" size. Too big for most shovels to handle alone. Too small to blast economically.

A real problem!

How would you lick it?

Contractor Heintz's solution was to team his two 16-ton LeTourneau-Westinghouse Rear-Dumps with a rubber-tired Tournatractor and a 2½-yd. shovel. As each of the many big boulders was reached, tractor and shovel lifted together, the tractor bracing the rock tightly against the shovel bucket. Meanwhile, one of the Rear-Dumps backed as close to the boulder as possible, its bowl in dump position to minimize lift required. Shovel and tractor teamed up to place and hold each boulder against the Rear-Dump bed. Rear-Dump operator then lowered bowl while shovel and dozer operators followed lift of rear-end to keep load from rolling out. As soon as body reached haul position, Rear-Dump drove away either to waste dump or deep fill where its electric-controlled dump and great strength of the 3 layer, all-steel body made it easy to roll the big boulders out of the bowl and safely over the edge of the fill.

Despite difficult loading, output averaged remarkably high. On one 4000' cycle, where haulers dumped on approach to the Willamette River bridge, each Rear-Dump delivered a load every 10 minutes. Production per unit per 50-minute hour averaged 5 loads (60 to 80 tons).

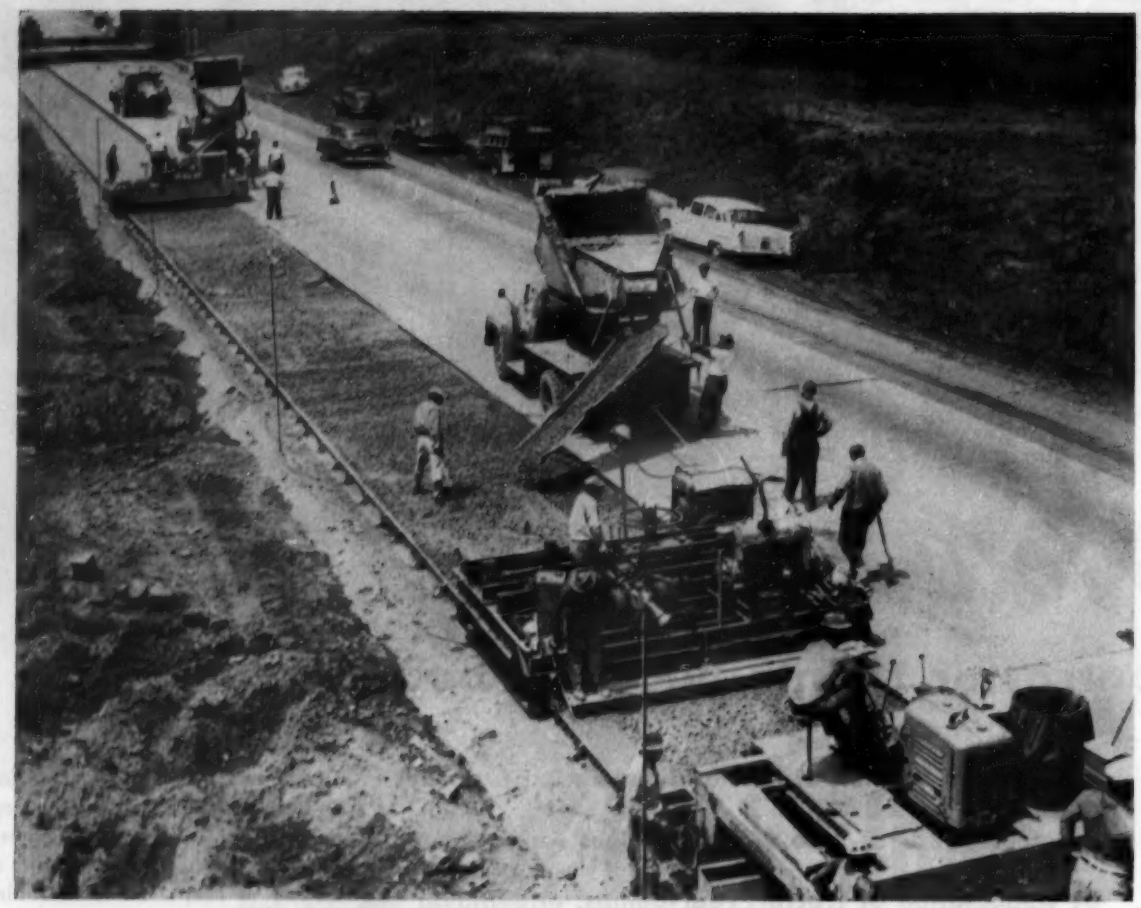
LeTourneau-Westinghouse equipment can pay off on your tough jobs, too. Let us prove it to you by showing you the machine in action.

Tournatractor—Trademark RT-619-Hb

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company



Fast dumping, double spreading, and triple finishing are good reasons why...

Single Paving Spread Lays Mile a Day

"PLANT-MIXED CONCRETE" is made in Rex truck-mixers and chuted into 5-yd Dumpcretes. Job had to be started so fast that contractor had no time to install mixing drums at plant.

BY FEEDING PLANT-MIXED CONCRETE to a 5-machine paving spread, the contractors widening New Jersey's Garden State Parkway chalked up what may be a national record for a single paving spread. They worked two 8-hr shifts, and laid an average of 5,080 ft a day of 12-ft wide unreinforced pavement 8 in. thick. In 32 working days, Villa Contracting Co. of Westfield, N. J. graded and paved 27 mi of widening, 13.5 mi in each direction. Their top day was 7,980 ft.

Plant-mixing and multiple finishing were the secrets of the fast production. Restricted quarters next to existing traveled lanes made it impractical to use pavers. Instead, the contractors kept a fleet of sixteen Dumpcretes highballing from a central plant to the

(Continued on page 131)

Production work

odd jobs

compaction

Brewster finishes ahead of schedule on Garden State Parkway

George M. Brewster & Son, Inc., Bogota, New Jersey, enthusiastically praise the 5 high-speed electric-control D Tournapulls which helped them finish their 1,250,000-yard section of the Garden State Parkway near Atlantic City "well ahead of schedule."

These 7-yard machines proved large enough and fast enough to pay off in pusher fleets . . . their self-loading ability also let Brewster use them profitably for one-machine finishing jobs.

6000′ cycle every 5½ minutes

With a pusher, they loaded faster than any other self-propelled scraper — 6 pay yards of soft wet material (85% sand, 15% clay) in 15 to 30 seconds. They accelerated fast and traveled fast, too. One typical 3000′ haul through traffic to build interchange roadbeds averaged only 2¼ minutes, according to detailed time study figures. Turn off fill, plus 3000′ return, also averaged 2¼ minutes — an average both ways, of 14 mph. Total time on this 6000′ cycle was 5½ minutes. Output per unit per 55-minute hour was 60 pay yards. Output per unit per 9-hour day, according to Asst. Job Supt. Lee Cochran, was around 500 pay yards. Because of the D Tournapull's low initial cost — half that of many bigger scrapers — lower interest payments, lower taxes, and lower operating costs, all this dirt was moved at a very low rate per yard.

Used singly, Tournapulls proved the ideal size for self-loading, too. Working alone, they helped Brewster do ditching, finishing and similar odd-lot assignments before paving. They drove everywhere under their own power . . . went through traffic safely at speeds to 28 mph. When a small amount of dirt was needed in an isolated spot, one of the "D's" could be quickly sent over pavement or cross country. A mile of travel took only 2 to 3 minutes.

Supt. likes short turning of "D"

Men on the job report some other important D Tournapull advantages also. Company Superintendent William O'Connor says, "I continually notice Tournapulls' short turning radius and their get-the-job-done ability. They work well whether you have a large volume of fill to be transported from a large pit, or a small amount from the close quarters of a small pit."

Asst. Supt. likes compaction of "D's" tires

Says Assistant Job Superintendent Cochran, "The ability of the 'D' to spread thinly and evenly always assures us of meeting compaction specifications. Those big tires do a good job; are just right to give us the necessary 95% compaction on the top two inches of fill. There is no necessity to do any spreading or dozing, beyond what Tournapulls do as they unload."

Operator likes comfort, ease of control

Says Operator George Haig, "I like the way the Tournapull people look out for the operator. Those foam-rubber seats to ride on and a cab overhead to keep out sun and bad weather give a fellow real comfort."

All these advantages can pay off for you, too, whether you use the 7-yd. "D" for production dirtmoving or scattered odd jobs. Over 2,000 "D's" are now in the field. Don't you think you owe it to yourself to see one in action? Call us for a demonstration NOW.

On production dirtmoving, Tournapull is loaded with 6 pay yards of damp clayey sand in 50 ft. The "D" can be loaded effectively by a patrol or tractors as small as 40 hp. Equipped with dozer blades, 2 "D's" can efficiently push-load each other. Or they can work alone and self-load.

New Jersey's Garden State Parkway, now nearing completion, extends 165 miles from Paterson to Cape May. Officials of the State Highway Authority estimate that in 1955, the first full year of operation, over 53,000,000 vehicles will use the road. Each of its dual bituminous concrete lanes will be 24 to 36′ wide, with 13 to 18′ stabilized-turf shoulders and a center island averaging 100′ wide. Grades are limited to 3% in most places.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-628-H-b

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

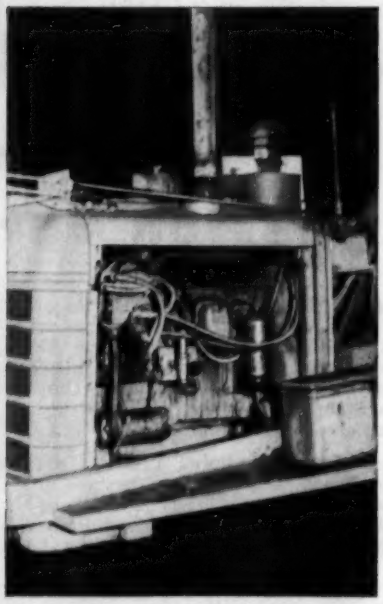
A Subsidiary of Westinghouse Air Brake Company

The Engineer's Report

CASE HISTORY

LUBRICANT RPM Delo Oils

FIRM Dana Company, Inc., Apple Valley, Calif.



This paving machine diesel worked more than 2400 hours, laid 85 miles of asphalt highway before even the head was removed.

No bearing, ring trouble in 6 years desert operation!

Sand, wind, dust and heat are tough on engines in the California desert where Dana Company, Inc., develops subdivisions, builds and paves streets and highways. But, using RPM DELO Lubricating Oils, not one engine lost a bearing or stuck a ring in 6 years. Even with constant dust conditions and rapid temperature changes—often from below freezing to 75°F. in a morning—they have no carbon and sludge problem. "RPM DELO Oils keep our engines very clean and cut repair costs," says Mr. Ross Dana, President. "One diesel in a paving machine laid 85 miles of asphalt, worked 2400 hours before it was touched. Then, only a valve grind was needed."

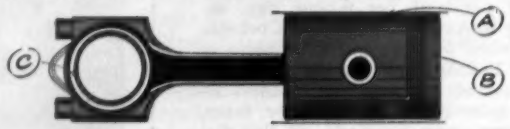
FREE FOLDER tells you about all the RPM DELO Oils and how they meet every heavy-duty engine condition. Write or ask for it today.

FOR MORE INFORMATION about petroleum products of any kind or the name of your distributor, write or call any of the companies listed below.

RPM DELO LUBRICATING OILS

TRADEMARK "RPM DELO" REG. U.S. PAT. OFF.

How RPM DELO Oils reduce wear, corrosion, oxidation in all Heavy-Duty Engines



A. Contain special additives that provide metal-adhesion qualities...protect parts whether hot or cold, running or idle.

B. Anti-oxidant resists deterioration of oil and formation of lacquer...prevents ring-sticking. Detergent keeps parts clean...helps prevent piston scuffing.

C. Special compounds stop corrosion of any bearing metal and foaming in crankcase.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20 • STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA OIL COMPANY, Barber, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado

ENGINEERED ESPECIALLY FOR TOUGH CONSTRUCTION DUTIES

performs on-the-job handling - faster - better - easier!

This new Prime-Mover built specifically for construction work provides practical answers to building contractors problems.

FOR EXAMPLE:

1. **Length of only 64 inches and 31½ inch width permit easy maneuverability where more cumbersome equipment cannot go.**
2. **Compact size allows operation over the same ramps, runways, hoists and towers commonly used.**
3. **Positive controls let even the inexperienced laborer operate the unit safely and efficiently.**
4. **Interchangeable bucket and flatbed increases cost-saving usefulness.**
5. **Dependable engine and proved transmission insure continuous service.**
6. **Recoil starter, large fuel tank, sealed-in lubrication, natural position steering bars, are added improvements.**

These features and improvements mean a Prime-Mover that gives you ready-to-go power for handling any material — anywhere on the job. Prime-Mover distributors are ready to demonstrate. See yours or write us

A Prime-Mover will place 12 to 17 cubic yards of concrete per hour. 10 cubic feet per trip.

A Prime-Mover will haul up to 300 bricks direct from yard to bricklayer. 1500 lbs. per trip, up 20% grades.

PRIME-MOVER

THE PRIME-MOVER CO., MUSCATINE, IOWA

How much does it cost you to keep the clutch pedals?

The figures are right on your books. Just add the charges of all those clutch replacements – of all their repairs – of all overhauls of overtaxed engines – of all the extra service work on axles and drive-lines damaged by shock-load starts.

And remember – these "fixed" costs are eating chunks out of your profits no matter what kind of standard-shift trucks you use or how much clutch-and-shift skill your drivers have.

These costs will shrink with Hydra-Matic GMC's*

With self-shifting GMC's, you not only reduce those expenses – but cash in on reduced down time and longer truck-life to boot.

And you can now have all Hydra-Matic's timesaving – effort-saving – truck-saving advantages...

– in 65 new Blue Chip models ranging up to 70,000 GCW

– in 7 two-cycle Diesel models from 30,000 GVW to 70,000 GCW

– in 15 new dual-purpose cab models from 16,000 GVW to 55,000 GCW

– in 9 c.o.e. "Stripaway" models from 32,000 GVW to 70,000 GCW

– in 9 rugged new tandem-axle models from 28,000 GVW to 70,000 GCW

– teamed with a wide choice of Blue Chip power plants – sixes, V8's and Diesels – from 125 to 230 h.p.

– in Blue Chip GMC's with greater-than-ever ruggedness

– improved turning ability

Get full details on any one of them – right now – at your GMC dealer's!

**Hydra-Matic standard on many models; optional at extra cost on some others*

GMC TRUCK & COACH – *A General Motors Division*

Your Key to Blue Chip Value

See GM Diesels at work at the
GENERAL MOTORS
POWERAMA
Lake Shore Drive, next to Soldier Field, Chicago
August 31 through September 25

EXCAVATION of 16-in. box-section next to existing slab is done by Allis-Chalmers HD20 tractor shovel with 5-yd bucket. Trucks stand across widening area to facilitate loading.

TRUCK RAMP pulled by Caterpillar tractor allows Ford dump truck to back down into boxed-out section for unloading. Parkway traffic is restricted to one lane next to construction operations.

SELECTED GRAVEL for subbase is laid in 8-in. thick lift by Jersey spreader mounted on dozer arms of Caterpillar D8 tractor. Crews work two 8-hr shifts a day to complete job on time.

COMPACTION of selected gravel subbase is done with International mechanical tamper. All equipment fleets maintain mile-a-day pace to keep ahead of fast-moving paving spread.

paving spread. Maximum haul was about 11 mi.

Standing on the adjacent lane, the Dumpcretes chuted their 5-yd loads in front of two spreaders spaced about 100 ft apart. The first, a Jaeger screw-type, struck off the mix at the 5-in. level while the second machine, a Blaw-Knox reciprocating type spreader, spread the top 3 in. Working two spreaders permitted trucks to dump faster, and also simplified the job for each spreader. Three finishing machines, a Jaeger and two Heltzels brought up the rear of the fast-moving spread. Dummy joints were made by inserting plywood strips into the plastic concrete.

The job was a whirlwind operation from beginning to end. To get the Parkway widened before seashore-bound throngs moved in, bids were received on a Friday, the contract was awarded the next day, and scrapers were stripping top soil Monday morning. Villa's associate, Weldon Contracting Co., followed a few days later with the paving.

The $1,722,000 contract called for the construction of a third lane next to the existing roadways on the wide center island.

Villa spearheaded the grading with a Caterpillar grader that stripped topsoil. Two DW21 scrapers followed behind, stockpiling the topsoil and rough grading. But the real workhorse of the excavating gang was an Allis-Chalmers HD20 tractor shovel with a 5-yd bucket. The big rig cut out a 16-in. box next to the existing lane and loaded the material into dump trucks standing across the line of travel. Most of the material was wasted.

Behind the HD 20, a grader finished the box cut, and a roller compacted the subgrade. The next operation was placing the 8 in. of selected gravel subbase. Dump trucks loaded with gravel backed down a movable ramp into the box cut and were quickly unloaded by a Jersey spreader mounted on a D8 tractor. Jackson and International vibrators compacted the gravel. Steel forms were then anchored in place with air-driven pins, and a Blaw-Knox finegrader traveled on top removing any excess material.

Because the contractor had to begin paving only a few days after the contract was awarded, he didn't have time to set up a conventional batching and mixing plant for supplying the Dumpcretes. Instead, he took over a commercial batch plant near the job, dry batched the materials, and dumped them into a fleet of five Rex 5-yd truck-mixers. As soon as they were loaded, the mixers backed up an adjacent ramp capable of holding three mixers at a time. They mixed the concrete for 5 min, and then dumped it into the Dumpcretes. The meth-

(Continued on page 133)

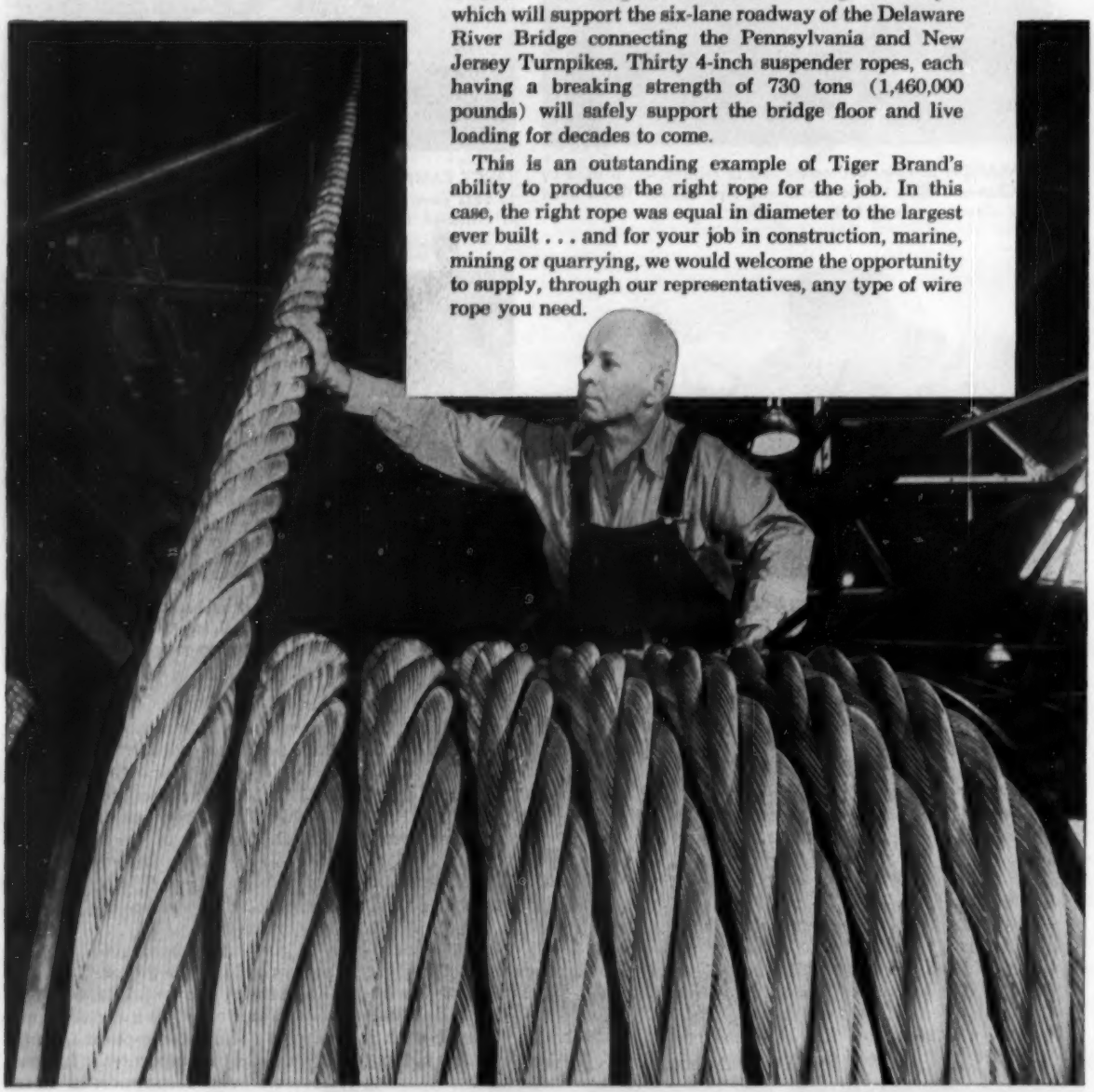
GIANT SUSPENDERS

In The Making

for the Pennsylvania-New Jersey Turnpike Bridge

You are witnessing the "birth" of the huge steel ropes which will support the six-lane roadway of the Delaware River Bridge connecting the Pennsylvania and New Jersey Turnpikes. Thirty 4-inch suspender ropes, each having a breaking strength of 730 tons (1,460,000 pounds) will safely support the bridge floor and live loading for decades to come.

This is an outstanding example of Tiger Brand's ability to produce the right rope for the job. In this case, the right rope was equal in diameter to the largest ever built . . . and for your job in construction, marine, mining or quarrying, we would welcome the opportunity to supply, through our representatives, any type of wire rope you need.



AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL, GENERAL OFFICES: CLEVELAND, OHIO
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USS AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

USS

UNITED STATES STEEL

SIDE BUCKET attached to Michigan loader grades 3-ft wide shoulder area next to slab. Unique rig fills holes, distributes suitable gravel, removes unsuitable material, and does rough grading.

FAST-MOVING LOADER quickly grades shoulder section with side-bucket. Contractor made rig for digging, loading, and transporting, operations not possible with conventional grader drop-blade.

od required extra handling, but it was easy to set up, and it did the job.

Shoulders

Shoulder work was started as soon as paving was completed. The 3-ft wide shoulders were 6 in. deep, and consisted of 3 in. of subbase, 2 in. of crushed stone, and 1 in. of bituminous concrete.

Grading was the big problem on the shoulders. Paving work had left the 3-ft strip next to the slab in rough condition. Some areas were low, others were high, and only part of the in-place material was usable. This meant that a grader's drop-blade could not do an efficient job of grading. Villa needed a rig that could scoop, load, transport rapidly, and dump. And that's what he got. His skilled mechanics made a small 3-ft wide bucket and attached it to the side of the bucket on a Michigan loader. Attached several inches below the big bucket, the attachment did a fast, easy job of rough grading the shoulders.

Behind the loader, a grader with a job-made drop-blade finished grading the 3-ft box. A Jackson vibrator with one shoe lowered to ride the grade, did the compacting. The upper lifts of material were placed with a Blaw-Knox widener and then rolled.

George Villa was in charge for Villa Contracting Co. C. V. Vanderhoff was principal engineer, and L. LeJambre was chief inspector for New Jersey State Highway Department.

DROP-BLADE ATTACHMENT on Caterpillar grader follows Michigan loader to finish shoulder grading. Note how steel plate projecting ahead of blade keeps dirt off concrete slab.

VIBRATING FOOT on Jackson machine compacts shoulder subgrade. Welded brackets hold shoe at proper grade. Crushed stone topped by 1-in. layer of bituminous concrete completes shoulder.

(Advertisement)

EIMCO TRACTOR

8th in a Series

Digging in a sedimentary sandstone this Eimco Tractor with loader-excavator attachment is removing overburden at an extremely low cost, see story below on how to

Strip Overburden—Economically

Mining companies have found that **Eimco 105 Tractors with Loader-Excavator attachments can be successfully employed in stripping operations at a savings in cost per yard moved.**

The job pictured above could be stripped with tractor-drawn scrapers or with Eimco loaders as shown. Both types of equipment have been employed with the results shown below:

4—10-13 yd. scrapers — load, travel to dump and return at 12 min. cycle each. Average 12 yds. per trip or 240 yds per hour.

1—Eimco 105 Excavator with 4 trucks of 8 yd. capacity load, travel, dump and return at 6.42 min. cycle each or 299 yds. per hour.

Cost on equipment involved is 25% cheaper on the Eimco 105 Excavator method yet production is 25% more. The cost of scraping is charged out at 21.6c per yard, the cost with the Eimco and trucks is charged out as 12.2c per yard.

Extra advantages obtained with Eimco equipment are in low maintenance, easy operation and in being able to load selectively.

Selective loading is extremely important when the ore body lies in uneven strata and the overburden must be moved without disturbing the valuable ore.

There are many exclusive features in the Eimco 105 Tractor which make it the most "talked-about" tractor on the market today. Steel castings, steel forgings and heavy fabricated steel parts are used throughout. The operator sits up front where he can see. Simple controls make the toughest jobs easy for the operator. Independently controlled tracks give the Eimco Tractor a maneuverability unknown in any other tractor.

See the Eimco Tractor — compare it piece for piece with any other tractor. You will agree that the Eimco is the finest tractor on the market.

THE EIMCO CORPORATION
Salt Lake City, Utah—U.S.A.

As a pusher, the Eimco Tractor operator is able to judge distance without error — the extreme maneuverability of the Eimco makes it ideal for these jobs.

Eimco Tractor with Excavator attachment loading overburden (see story previous page.) Loading time for 8 yard trucks is 1 min. 25 seconds to 1 min. 40 seconds. Length of haul approximately one quarter mile. Damp weather has increased weight of sand to 3600 pounds per yard.

Large pieces of trap rock (appr. 9,000 lbs. in bucket) are loaded easily by the Eimco Loader-Excavator. The operator has placed one or two buckets of loose material in the truck before loading the big rock.

Eimco Bulldozers even out clay fill dirt. Quick reversals and up-front visibility on Eimco Tractors permit following the load and doing a most efficient job.

An Eimco loader digs in for a full bucket, trams 50 feet to cast it overhead into the canyon and back to the face again. Two trips with full bucket a minute for a rate of 180 yards per hour while traveling more than two miles in shuttle service.

Two Eimco Bulldozers — one a cable controlled unit with angle blade and the other a hydraulically operated unit with a straight blade. These 37,000 pound tractor units team up to make short work of leveling.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Baltimore, Md. Pittsburgh, Pa. Seattle, Wash. Pasadena, Calif. Houston, Texas. Vancouver, B. C. London, England. Gateshead, England. Paris, France. Milan, Italy. Johannesburg, South Africa.

EIMCO

FOR TESTING USED OIL, laboratories manned with trained specialists are at your disposal. This technician in the Pure Oil Co. lab in Chicago is testing a sample of oil for viscosity. It takes about two weeks for a lab to give you a complete answer.

ON THE SPOT TESTING is offered by Shell Oil Co. It gives you the answers to contamination, dispersancy and alkalinity.

You Can't Lose by Having Your Used Oil Tested

SOME MAJOR OIL COMPANIES offer a free oil analysis service. At least one will help you do it "on-the spot," while others encourage samples to be sent into laboratories where complete tests are made under scientifically controlled conditions. Regardless of what company makes the test, they all have one common goal—to tell you if your sample of oil is contaminated or if the remaining additives in the oil are still effective. The answer you get will include recommendations to help you lower maintenance and operating costs on your equipment.

Such a test can pin-point disorders of an engine, reveal a plugged air cleaner, a faulty carburetor, or even tell you if the coolant from the radiator is leaking into your crankcase. This information will also suggest what you can do to correct abnormal conditions.

The Shell Method

One well-known major oil firm, Shell Oil Co., recently announced an "on-the-spot" testing service called ADC Oilprint Analysis. Admittedly this test is not as complete as one in their laboratory, but it does give the answer quickly to three important characteristics considered necessary for good oil—dispersancy, over-all contamination and alkalinity.

The person conducting the test places a drop or two of used oil from the engine to be tested on a piece of special filter paper supplied by Shell. The pattern of the spot, formed in a few minutes, enables the trained user to determine if the oil should be changed or continue in use, as well as revealing any unusual operating characteristics of the engine.

Shell also uses a special liquid indicator to test the alkalinity of oil. The indicator gives a color reaction. The oil spot is observed one minute after testing with the indicator. If it shows up strong green or blue, the oil can still be used. If a yellowish spot appears, the oil is neutral, alkalinity has been depleted. If the spot turns orange or red, acidity is indicated, and the oil should be changed.

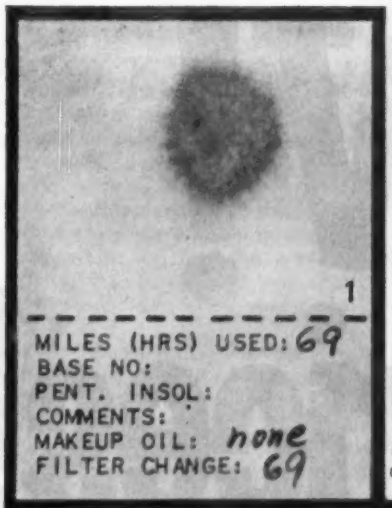
B. G. Symon, manager of Shell's lubricants department, makes this statement: "ADC Oilprint Analysis is not yet a panacea for all engine trouble. When time allows, lab testing will, of course, give a more complete indication of used oil condition. But the progress we've made is tremendous. Our Oilprint Analysis has amazed maintenance men we've worked with by its simplicity and the scope of the information it provides."

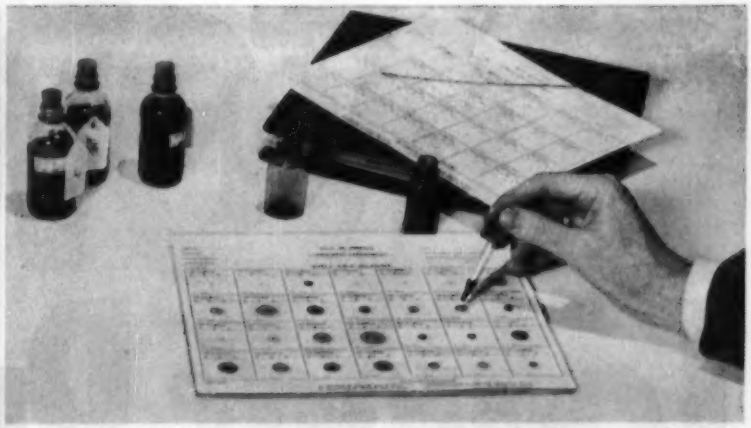
Shell's on-the-spot testing can do one thing for certain. It can help give an answer to immediate troubles, or it can prevent more serious trouble, by giving you an answer when the trouble is just getting started.

Pure Oil Way

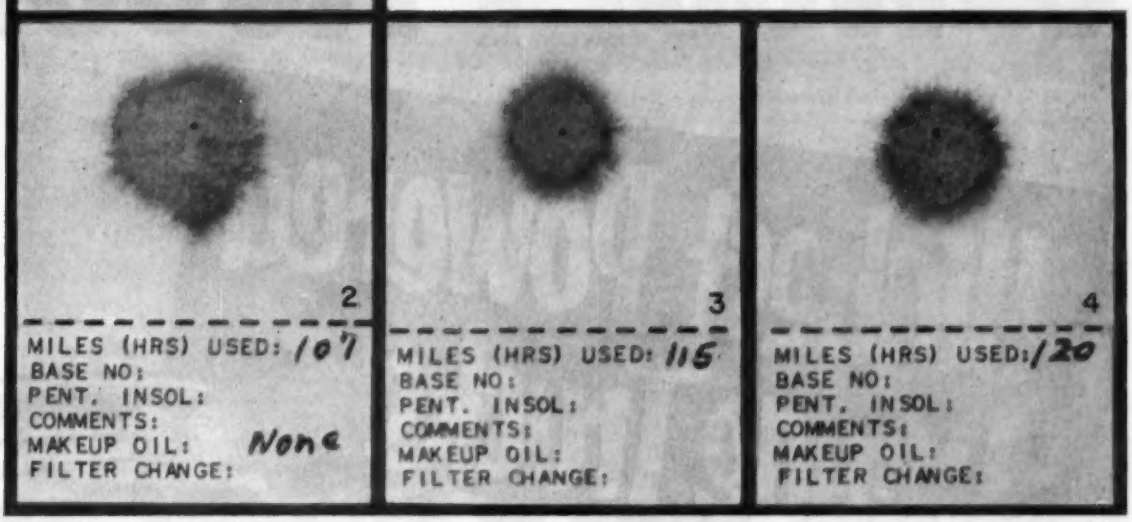
The Pure Oil Co. provides a complete oil analysis service for contractors, on a streamlined laboratory treatment basis.

R. A. Shrewry of Pure Oil's technical service department explains the system this way.





EQUIPMENT NECESSARY to make the Shell on the spot oil field analysis. Oil samples on the left, standard wire rod for drops, indicator bottle and the permanent record card.



THIS IS A SERIES of ADC Oilprints taken from a diesel engine. Note successive darkening in 51 hr of operation. After 120 hr, oil still has ample dispersancy. The dark spot appearing in each pattern is a guide where test should be made.

A representative from the company extracts a full pint of oil from the engine with a suction gun. This sample, together with a history and maintenance information from the engine in question, is forwarded to the laboratory where it undergoes about 12 tests in all. The service consists of two important phases. First, the used oil sample is carefully and completely analyzed to determine the presence and amounts of the various contaminants. Secondly, a skilled engineer interprets the laboratory analyses to determine: (a) what is wrong, if anything, (b) the possible causes of any abnormal condition and (c) what the operator can do to correct unsatisfactory conditions. All of this information is listed on a form and personally delivered to the owner by the field representative. The company feels that a personal interpretation of the recommendations is most important.

Because of the completeness of the oil analysis service, Pure claims that if any operator takes advantage of it, it is an important key to reducing operating and maintenance costs. This is possible by (a) detecting condition in the engine which wastes fuel, (b) detecting conditions that cause loss of power which reduce pay load, (c) establishing proper oil and filter change periods, (d) providing operator with a means of checking maintenance and general mechanical conditions of engines used.

The Oil Story

Oil to an engine is as necessary as blood to a man. Just as an analysis of blood will help reveal the physical condition of a human, a scientific analysis of used oil will expose much of the mechanical condition of an engine by determining the kind and amount of contaminants present in the oil.

A SHELL SPECIAL INDICATOR such as is being used here, determines alkalinity of oil. If the oil spot turns red, it's no longer fit for use.

Contaminants in oil may come

NOW! Lowest Prices!

Highest Powered Dodge Trucks Ever Built!

LOWEST PRICES! Many standard models of Dodge trucks are priced lower than all other makes! Yet with these low prices, quality-built Dodge trucks are dependable as ever.

HIGHEST POWER! Power-Dome V-8 engines, with 169 to 202 hp., are the most powerful of any leading trucks. Save time, save on operating costs, with these short-stroke V-8's! You'll save with Dodge thrifty 6's, too!

THE FORWARD LOOK! Now Dodge brings the Forward Look to trucks. New wrap-around windshield (biggest of any make!) means added visibility and safety! More reason why you should look at Dodge before you buy any truck. Why not phone your dependable Dodge truck dealer, today?

DODGE *"Job-Rated"* TRUCKS WITH THE *FORWARD* LOOK!

OIL TESTING . . .

Continued from page 137

(1) from the combustion chamber, (2) from the engine itself, (3) from outside the engine, and (4) from oil deterioration.

I—Contaminants from the combustion chamber find their way past the rings and into the crankcase. These may be referred to as "blow-by-products." They consist of:

(1) SOOT—finely divided carbon deposits formed by incomplete combustion of the fuel in the combustion chamber. An excessive amount of soot is a symptom of trouble which increases the operator's expenses because of wasted fuel and loss of power.
Some of the causes of soot are:
  (a) Insufficient air
  (b) Faulty carburetion or injection
  (c) Low compression
  (d) Faulty or malfunctioning ignition systems
  (e) Faulty fuel pump

(2) GASOLINE OR DIESEL FUELS, when improperly burned in the combustion chamber, pass down to the crankcase causing dilution of the engine oil. Excessive fuel dilution is most undesirable for two reasons. (1) It makes the engine oil unfit for use and (2) It is a complete waste of money, since no work is obtained from fuel in the engine oil.
Some of the causes of fuel dilution are:
  (a) High fuel level in carburetor
  (b) Excessive choking or idling
  (c) Faulty injectors

(3) GUMS — which generally originate with the fuel used, if present in excessive quantities can clog carburetor jets, fuel lines and crankcase breather caps. It causes varnish-like deposits on engine surfaces and can result in stuck valves and valve lifters, as well as deposits in the intake manifold. Some causes of gum are:

AN OIL ANALYSIS will reveal a condition such as this plugged crankcase breather cap on the left. Such a test not only tells you what is wrong but also how to correct it.

  (a) Poor fuel storage
  (b) Inadequate crankcase ventilation

(4) CARBON — which may be found in "coffee ground" sludge or in the crankcase in various size pieces, can be picked up by the oil pump and circulated through the entire lubricating system. Hard carbon particles can damage bearings, valve lifters and other close-fitting engine parts.
One cause of carbon is high piston temperatures.

(5) LEAD COMPOUNDS — which are residues left from the combustion of fuels containing tetra-ethyl lead, find their way past rings to the crankcase. These residues, which can discolor engine oils, are not harmful because the particles are extremely fine and non-abrasive.

A BADLY SLUDGED ENGINE shows up in an oil analysis. Filters such as this one are not effective long in an engine that is sludged.

II—Contaminants from the engine itself are due to wear or from fluids from the cooling system. Such contaminants consist of:

(1) METALS—such as iron and steel when found in extremely small particle size can be assumed to be due to wear. Large particles or pieces usually denote mechanical failure of parts within the engine.

Aluminum particles in the oil are usually due to piston wear or in some engines from bearing wear.

Copper, babbitt and bronze—which are common bearing metals—may be found in oils as a result of bearing damage due to overspeeding the engine, abrasive material in the oil, overloading engines or to normal fatigue.

(Continued on next page)

LEADING CONTRACTORS USE McCarthy Drills

PUBLIC UTILITY AUGER DRILL

Bores holes from 4½" to 24" in diameter under sidewalks, roads, building foundations, railroad tracks, landscaped grounds, etc. Fithian Contracting Co., Youngstown, O., using McCarthy Public Utility Auger Drills, completes pipe line jobs, formerly taking weeks, in a few days.

SELF-PROPELLED HORIZONTAL AUGER DRILL

Will bore 6" and 8" diameter holes 120 feet horizontally at rate of six feet per minute maximum. Four individual, self-locking jacks maintain correct drilling level. In one day a New Castle, Pa., operator bored holes of various depths totaling 840 ft. through shale and sandstone, using this McCarthy Auger Drill.

Heavy-Rugged Powerful

VERTICAL AUGER DRILL

Operating men who have made actual on-the-job tests find the McCarthy Vertical Auger Drill a standout for mobility, stamina, ruggedness and versatility. On a 2-million dollar, 5-mile stretch of superhighway between Hubbard, Ohio, and Sharon, Pa., The Apex Powder Co., Canton, Ohio, cut blasting costs approximately 20% as compared to air, well or churn drilling. Cutting through two large areas of concentrated rock, 150 holes 15 feet deep were bored for each blasting pattern. 3,000 cubic yards of sand rock were moved at each blast. Due to the ruggedness and mobility of McCarthy Drills, there was no time lost. For further information, write Salem Tool Co. and our distributor will contact you.

SALEM

DRILLING EQUIPMENT SINCE 1901

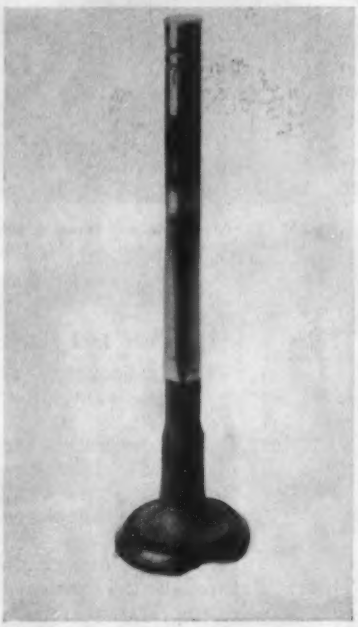
THE SALEM TOOL CO.

765 SOUTH ELLSWORTH AVE.

SALEM, OHIO · U.S.A.

OIL TESTING . . . Continued

(2) COOLANT LEAKAGE — when water enters the crankcase can cause sludging or possible foaming of the oil. Some anti-freeze materials will cause a gummy deposit capable of sticking valves and hydraulic valve lifters. Leakage of coolant containing anti-freeze is a double loss of money, since it makes oil unfit for further use, and is also lost anti-freeze.



THIS EXHAUST VALVE failed because of high temperature in the engine. The oil test will reveal when an engine is running too hot.

III—Contaminants from outside the engine are chiefly dirt and water.

(1) DIRT—which is present in all air to varying degrees, is one of the major causes of excess wear and premature engine faliure. Air containing abrasive dust particles can actually cut cylinder walls and piston rings to destruction. Some sources of dirt are:

(a) Air—which contains abrasive dust particles churned up by high speed adjacent traffic in a dry light soil area.

(b) Overhauling — when done in a dirty or dusty area, may allow dirt to enter the engine. All lapping or grinding materials must be thoroughly cleaned from the reworked engine.

(2) WATER—which forms at the rate of five quarts for every gallon of gasoline burned, is mostly expelled through the exhaust. However, some moisture will pass the rings into the crankcase. Excessive water in the crankcase can cause sludge and rusting. In cold weather, water in the oil may freeze and impair oil flow and lubrication.

Sources of water in engines are:

(a) Leaking cooling systems

(b) Crank case condensation due to poor ventilation or low temperature operation

IV—Contamination of engine oils by products of oil deterioration cause the oil to become too thick. These materials, which are carbon and tar-like materials, thicken the oil enough in extreme cases to impair proper oil flow to close-fitting parts. Some causes of oil breakdown are:

(a) High crankcase temperatures

(b) Unstable oils

(c) Extended oil use

It is seen that abnormal amounts of the various contaminants in used crankcase oils are reflections of troubles and potential failures in the engine. Many times these troubles go undetected for long periods of time which needlessly increase operating costs. The detection of potential failure of engine parts before they occur can enable you to eliminate expensive breakdown in the field and out on the road.

ROAD BUILDING?

Get the jump on competition with this 5½ yard Manitowoc 4500

FAST JOB-TO-JOB MOBILITY
FAST ON-THE-JOB ERECTION

INDIANA TOLL ROAD — Proof of Manitowoc's mobility and fast, economical erection on the job. Western Contracting Corporation of Sioux City, Iowa, unloaded and erected this 4500 in record time "between trains". Total unloading and erecting time was less than four days. Because of its narrow, low travel clearance and design, unit was shipped on a flat car without having to be completely dismantled. This 5 yard dragline with 140 ft. boom was assigned to excavate more than 200,000 yards of material.

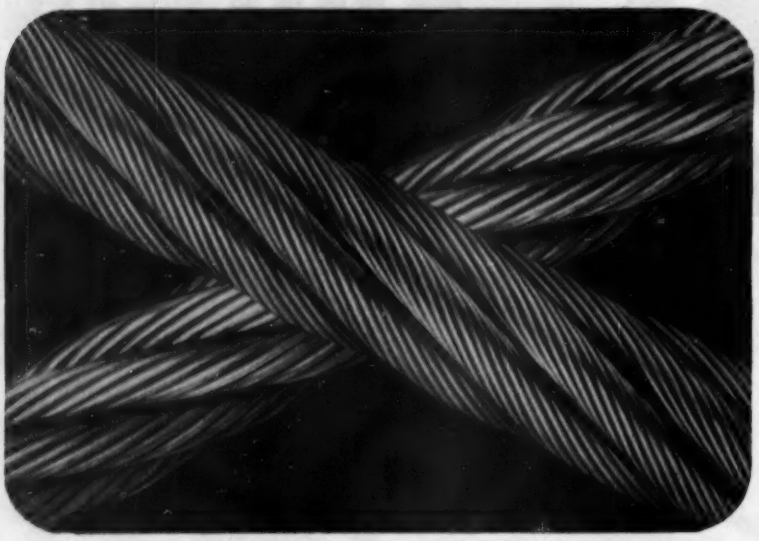
BIG DIGGING CAPACITIES
FAST WORKING CYCLES

WEST VIRGINIA TURNPIKE — Latrobe Construction Co.'s 4500 Manitowoc shovel with 5½ yd. bucket moved 550,000 yards of rock in a 4-month period — averaging 6000 yards per eight-hour day, with performance reaching a maximum of 778 yards per hour in "well shot" rock.

More and more successful road building contractors across the country are making the Manitowoc 4500 the "big tool" on their big jobs. When you have big yardage to move — move it fast with a giant Manitowoc 4500. Only the "4500" has the perfect combination of big machine capacity and the mobility and fast, simple portability of small machines. It can be easily trailored from job-to-job or transported by flat car. On the job it can be erected in a matter of several days and is easily maneuvered from one location to another without trailing a cable. Handles big rock without picking or scratching. With one 4500 instead of several small machines, you cut down on the number of operators and oilers on the job. Get the edge on competition — give yourself a "break" on your next bid — figure on a Manitowoc 4500. Write Manitowoc Engineering Corp., Manitowoc, Wisconsin.

MANITOWOC
SHOVELS 1-5 YD. Speedcrane CRANES 20-100 TON

FIRST WE DEVELOPED 1105 ROPE WIRE.



THEN WE MADE ROEBLING'S

Royal Blue

WIRE 1105 ROPE

1105 takes Royal Blue out of the ordinary wire rope class.

1105 is a rope wire that's new—that's stronger. It's the biggest news in many years.

1105 is the result of more than a century of research and development—it's the wire that gives Roebling Royal Blue the stamina that pays off in service.

Contact your Roebling distributor or write us for the full story.

ROEBLING

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WELL-TRAINED OPERATORS, whose pride in their machines is reflected in their work, are responsible for putting Forcum Engineering ahead of schedule on Tennessee Rt. 54, the superintendent says. Above, Tournapulls move over well-kept haul road.

TRACTOR DOESN'T STOP PUSHING when scraper is loaded, but continues until scraper is in second gear and rolling at high speed. This is one of many cycle-reducing techniques developed by operators, who are given responsibility for their machines

'Give' Operator His Own Machine

WELL-TRAINED earth-moving equipment operators are largely responsible for keeping the Don Forcum Engineering Co. of Dyersville, Tenn., ahead of schedule on their 10-mi stretch of Tennessee Highway 54, according to Job Superintendent G. E. Parker.

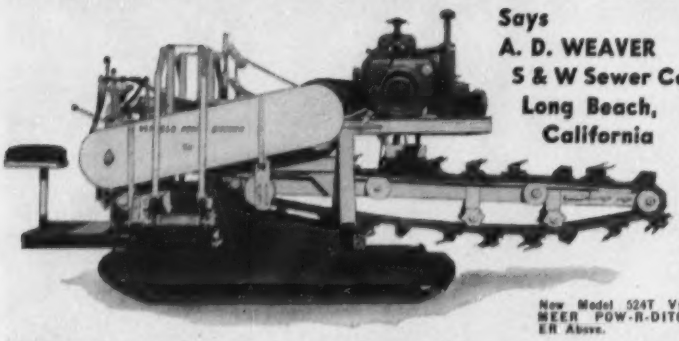
Parker's operators are skilled workmen who know their machines and how to get the most out of them. He credits Forcum with instilling in them an uncommon pride in their equipment and in their work.

The key to the operator's new attitude, Parker thinks, is the large degree of responsibility which Forcum allows him to assume for his own machine. If it has to be lubricated, he aids the lube man and checks on the job after it's finished. If his scraper breaks down, he assists the master mechanic. If the trouble is minor, he repairs it himself.

According to Parker, this responsibility creates a new attitude which reflects favorably in his work. Several examples of how confidence and pride in their equipment have carried over in their operations are to be found at the Route 54 job where six Tournapulls, push-loaded by an HD-20 and a Tournatractor, are moving

"60% LOWER LABOR COST WITH MY POW-R-DITCHER"

Says
A. D. WEAVER
S & W Sewer Contrs.
Long Beach,
California



New Model 524T VERMEER POW-R-DITCHER Above.

BIG DITCHER PERFORMANCE AT LESS THAN HALF COST!

Here's the heavier, stronger, more rugged ditcher that digs for less . . . because it costs so much less! The Vermeer Model 524T POW-R-DITCHER is ideal for contractors, municipalities, utility companies, etc. Digs 8", 10", 14", 18" and 24" wide and down to 6 feet deep. Has 5-speed International Truck Transmission, hydraulically engaged steering controls. This self-propelled, one man operated ditcher is designed to handle wide foundation footings, gas, water and sewage lines at speeds of 1' to 15' per minute. Weighs 5,400 lbs. Get the facts now on this **low priced ditcher** that does the work of more expensive ditchers and trenchers . . . **at a fraction of the cost!** Smaller Vermeer Pow-R-Ditcher models also available. Write for name of distributor and complete details.

VERMEER MANUFACTURING CO., PELLA, IOWA

Practical Foundation for Pure Luxury.

Writers' Manor will be a $3½ million luxury highway hotel in southeast Denver. Writer Brothers are the developers and general contractors—Huntington and Brelsford, the architects.

Gates Form Ties were the practical choice for this luxury hotel. They're the practical choice for all projects, large or small...because they increase speed of construction—give maximum efficiency—and lower overall costs!

There's a GATES FORM TIE for every concrete construction need!

Available from your nearby Gates Dealer—or write for further information to:

GATES & SONS, INC.
DENVER • SPOKANE

HIS OWN MACHINE . . .
Continued

some 500,000 yd of dirt near Brownsville.

The Tournapull operators have been taught to spread on the run whenever possible, and then to turn and blade the fill to keep it level for use on a fast haul route on later runs.

When they are returning to cut, operators have formed the habit of checking to see that a pusher is available. If all the pushers are working, the Tournapull operators drop their blades along the road bed to make it a better haul road. Because they plan their cycle a step or two ahead, dead standing time is cut to a bare minimum, Parker says. And by keeping the haul road in top shape they are able to haul in fourth gear in places where they normally would have to stay in second.

Simple Trick Cuts Down Cycle Time

Another simple trick also cuts down on scraper cycle time. When the scraper is filled, the tractor does not stop pushing immediately, but follows through and continues to push until after the scraper blade has been withdrawn and the Tournapull is in second gear and rolling at high speed.

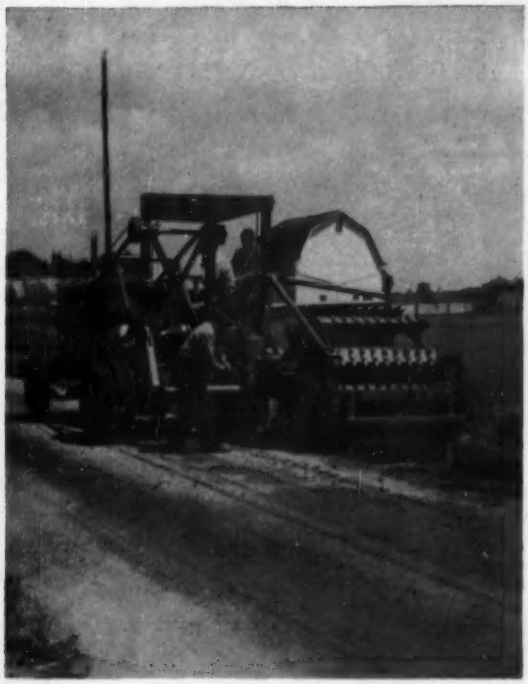
Parker estimates that over the past year his scraper fleet has been available 92% of the time despite the fact that three of the scrapers have logged more than 8,000 hr and two others have more than 4,000 hr.

Operators Attend School

Parker and all his operators have attended the service training school held by LeTourneau. With the knowledge gained there and through previous experience, operators are able to detect minor difficulties and can correct them before they become major repair jobs.

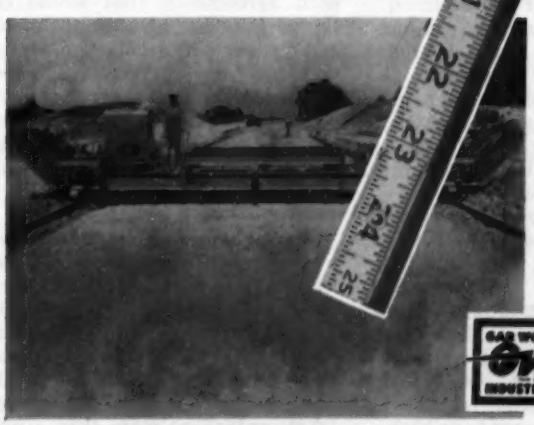
"When something goes wrong with a machine it is fixed immediately, and it's not wired or patched but properly repaired—a practice which has paid big dividends in the long run," according to Parker.

Now that Forcum has developed the operator's pride in his machine, they intend to maintain that attitude. Each winter all their equipment is steam cleaned and repainted. No operator drives an "old" machine for them.



HI-WAY WIDENER DIGS CLEAN TRENCH IN ONE PASS

WASTE IS ELIMINATED WITH THE SPREADER



POWER FINEGRADER CUTS GRADE EXACTLY TO SPECS

How to **IMPROVE** road building **TECHNIQUES**

GAR WOOD-BUCKEYE
HI-WAY WIDENER

Digs up to a mile of highway widening trench a day for as little as $58! The *only* machine that presents a complete, low-cost method of excavating and subgrading along the shoulder . . . Digs a clean, graded trench of uniform width and depth in one pass, *without disturbing the subgrade.* Subgrade is ready to receive concrete or black top. Spoil discharged on either side of trench or directly into trucks with an optional loading conveyor. Cuts up to 48" wide and 18" deep. One-man operation.

GAR WOOD-BUCKEYE
SURFACE
MATERIAL SPREADER

Eliminate excess labor, save material and time! Spread exactly where wanted–to controlled depths–with clean cut edges–leaving no material to be spread or raked by hand. Flow regulated for either uniform or tapered spread, from a sprinkle to 2½" depth. Width of spread can be narrowed in 6" multiples. Widths: 9', 10' & 12'.

GAR WOOD-BUCKEYE
POWER FINEGRADERS

Your last grade-building step between paving profits and loss! Cut grade exactly to specifications all the way, ready for the paving crew, with NO high or low spots in any soil... Eliminate dollars lost in concrete for slab that's too thick; eliminate chance of penalties for slab that's too thin... Two models, for widths from 10' to 25'.

GAR WOOD INDUSTRIES, INC.
WAYNE, MICHIGAN

No. 5518

On-the-Job
CONTRACTOR-LABOR RELATIONS

by LEON B. KROMER, JR.

New Minimum Wage Rate

BEFORE A RECENT CONVENTION of the New York State Federation of Labor, AFL, Gov. Averill Harriman stated that the Administration's proposed 15¢ increase in the present 75¢ minimum wage under the federal Wage-Hour Law was "piddling". He came out strongly in support of the AFL-CIO aims of at least a minimum of $1.25 per hr.

Whether or not you agree with the governor, you can be sure that the minimum hourly rate is going to be increased. Both the House and Senate have now passed, by large majorities, bills to increase the amount to $1 per hr. Administration forces had hoped to get this reduced to 90¢ but were unsuccessful. Effective date for the increase is March 1, 1956, under the House measure; next January 1 under the Senate's.

What you build will determine how seriously you will be affected by the increase in the minimum rate. If you repair industrial plants, build highways or bridges, undertake plant expansion projects, chances are your employees are covered by the Wage-Hour Law.

Who is Covered?

Briefly, this law, which is officially known as the Fair Labor Standards Act, covers all employees (other than bona fide executive, administrative or professional employees) engaged in commerce, the production of goods for commerce or in closely related occupations directly essential to production of goods for commerce. Covered employees must be paid at least 75¢ per hr, and at least time and one-half the basic hourly rate for all hours worked in excess of 40 in any regular scheduled work week.

Overtime is calculated on the basis of total hours worked in one work week. Longer hours worked in one week cannot be offset against shorter hours worked in a previous or following week.

If you are confused as to whether your employees are covered don't let it alarm you. There are plenty of contractors just as confused. How can a man working on one job be covered, and be exempt when doing the same work on another? It stems from the interpretation issued by the Wage-Hour Administrator.

Employees working on "new" construction, say the regulations, are generally exempt. But those on reconstruction, expansion, or repair of existing facilities (which produce goods or are otherwise directly related to interstate commerce) are covered.

What is "New"?

New construction is usually original construction such as the building of an entirely new industrial plant. Even though this plant, when completed, will produce goods for interstate commerce, courts have long held that the actual construction is too remote from that end result to consider that the contractor's employees are doing work directly related to interstate commerce. Even on this type of work, however, some employees may be covered. Examples: A stenographer who writes letters that go out of the state; a telephone operator who places or receives out-of-state calls.

The erection of an addition to an existing plant is not new construction under the regulations, regardless of the extent of the addition. Employees not otherwise exempt as supervisors, etc., are covered. The same is true for the construction of a new bridge to replace an old one; a new interstate highway to replace one going through cities or one that is otherwise inadequate.

Not long ago a large contractor building a new bridge for a new highway found that all his draftsmen, watchmen, etc. were covered, as well as all the building trades employees (to whom he had been paying overtime under trade agreements) because the bridge replaced a ferry that had been used for a nearby secondary highway. Learning the hard way cost this contractor more than $9,000 in back wage payments.

What construction isn't covered? Schools, churches, housing developments or additions to these or similar projects are not, even though certain employees may be covered because of what they do. (See above)

Regardless of the effective date of the new increase that may be agreed upon by Congress, it is not too early to review your payrolls and pay practices. Remember that a watchman working 56 hr a week (at $1 per hr) will earn $64; if he works five 16-hr days he will earn $100 a week. It may be advisable, therefore, to revise your hiring practices and employ more watchmen with less overtime hours. It requires some study now, not when you are faced with the new minimum rate.

If you are in doubt as to whether or not your employees are covered, consult your attorney or the regional office of the U. S. Dept of Labor, Wage - Hour Division. Knowing definitely the correct answer can save you plenty of money.

Wage Negotiations—1955

The barometer rose sharply in New York City last month as wage negotiations between the Building Trades Employers Assn. and the major trades bogged down. It looked as though the city was faced with its first major strike in 23 yrs. A series of all-night bargaining sessions ended the threat with agreements that would set the pace for the balance of the 20-odd contracts in negotiation. Under the two-year agreements sheet metal workers, engineers, carpenters, cement masons, concrete workers and metal lathers received a 45¢ package—15¢ increase July 1 and 10¢ January 1 and July 1, 1956 and January 1, 1957.

The two-year agreements follow a pattern, which seems to be growing, of negotiating long term agreements with automatic increases during the life of the contracts. Cost-of-living increases have long since faded out of the picture. Increases today for contracts extending more than a year

(Continued on page 149)

"Sheared right at the drill holes ...no back break"

This line drilled shot by Nello L. Teer Co. is another example of the close control that can be obtained with the ROCKMASTER® Blasting System.

This 30 ft. high horseshoe-type bench had to be trimmed to a ¼ to 1 slope for concreting the north portal of the new West Virginia Turnpike tunnel. Precise control of the blast was especially important to the contractor, because any back break would mean expensive extra concrete work.

The diagram above shows the ROCKMASTER pattern that was used. The results in the picture are obvious. The wall sheared just at the line drilled holes and there was no significant back break.

For any job, special or regular, ROCKMASTER can give you the results you want. For complete information on the ROCKMASTER Blasting System, Atlas explosives and blasting accessories, write for your copy of the new Atlas Explosives Catalog.

ATLAS

ATLAS EXPLOSIVES

"Everything for Blasting"

ATLAS POWDER COMPANY,
WILMINGTON 99, DELAWARE

Offices in principal cities

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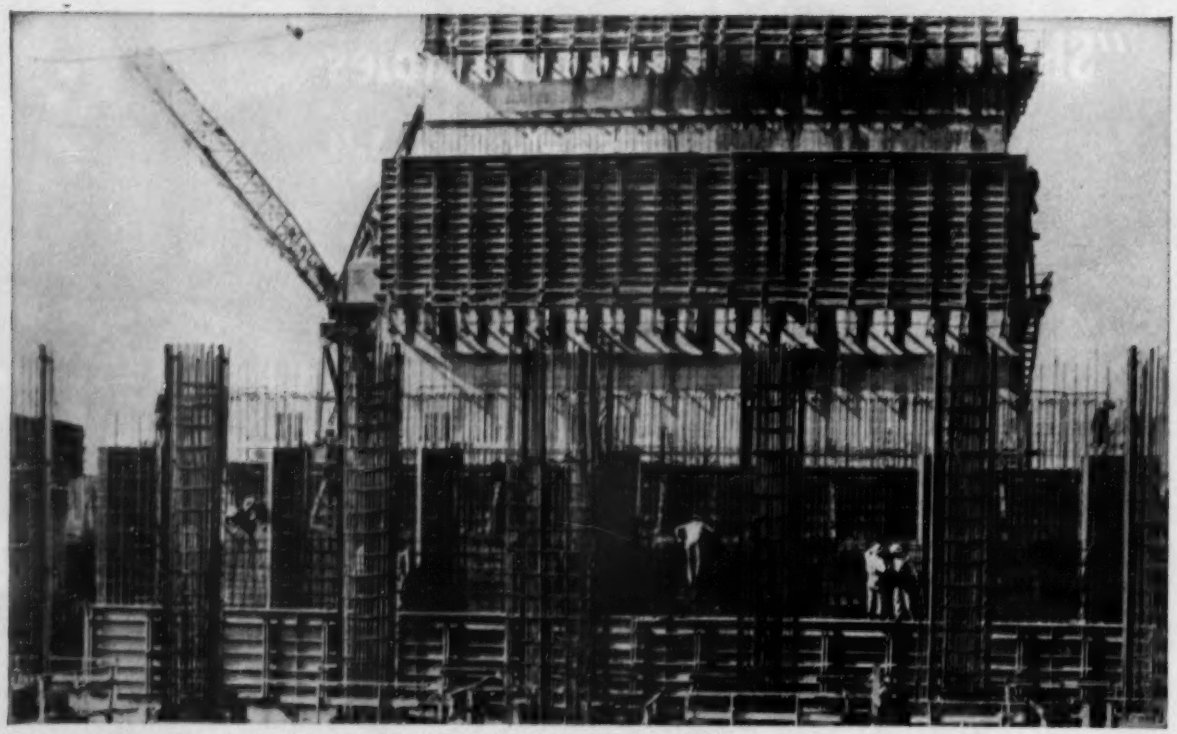

Close-up view of discharge side of one of the 14 main intake bays on The Dalles Powerhouse structure. The front span of Blaw-Knox Wall Forms is in a single 86-ft. long assembly to form the gallery wall. Forms are approximately 18 ft. high. Also in use on this project are 8 Blaw-Knox CAC-4 air-operated 4-cu. yd. Concrete Buckets.

Concreting on the Dalles Project Simplified with Blaw-Knox Steel Forms

Improved Forming Method Result of Experience on Chief Joseph Powerhouse

● Greatly simplified forming methods, which are speeding the concreting pace and cutting pouring costs on the Columbia River Dalles Project, are the result of a radical departure by Blaw-Knox Steel Form engineers from the accepted form design generally used on this type of structure. This new design proved so successful in concreting the Chief Joseph Dam, from a standpoint of easy operation and economy, that The Dalles Powerhouse Constructors were eager to apply similar Blaw-Knox Steel Forms to their project.

Shown from the upstream side are the Blaw-Knox Steel Forms for the 60-ft. spillway span and bridge deck. The forms are self-supporting over the span. They have adjustable hanger type connections at the ends and are also designed for adjustable camber.

Because of the dramatic improvement in concreting with these 18-ft. high prefabbed Steel Wall Forms, pours up to 86 feet long are accomplished in some of the massive solid walls. Wherever possible, large sections of forms are utilized to simplify the job of transferring panels from one unit to another, and to hold tie rods to a practical minimum. The forms are used progressively from bay to bay with the same lift placed in each unit at 3-week intervals. This plan of construction permits greater re-use of forms than is ordinarily possible on powerhouse jobs.

The Dalles Project is a typical example of the way Blaw-Knox Steel Forms and Blaw-Knox Engineer's Consultation Service can help reduce the number of necessary steps in your forming operations, save time and materials, and cut concreting costs. Whether you're building big dams, tunnels, bridges, retaining walls or sewers, call in Blaw-Knox engineers in the preliminary planning stage to solve difficult forming problems *before* they're on the drafting board.

BLAW-KNOX COMPANY

STEEL FORMS DEPARTMENT • BLAW-KNOX EQUIPMENT DIVISION

P.O. BOX 1198 • PITTSBURGH 30, PA. • PHONE STERLING 1-2700

LABOR . . . Continued from page 146

are based strictly on negotiations.

Boston ironworkers signed a two-year agreement providing for a 15¢ increase each year; plumbers in Reno, Nev., ended a 33-day strike with a two-year contract that granted an immediate 25¢ increase; 17 trades in Cleveland settled for two-year contracts with 8¢ increases each year; three trades in Schenectady, N. Y., settled for two-year agreements with 7½¢ each year.

There are two definite advantages for contractors in long term agreements — a stability of labor relations (labor problems always seem to increase before and during collective bargaining) and a stability of labor costs. With few jobs lasting more than two years, contractors can more accurately estimate labor costs when preparing bids.

New Data on Building Labor Costs

For those who ask when wage increases are going to stop, a study of a new bulletin recently issued by the U. S. Dept. of Labor is recommended reading. It contains a history of building trades wages from 1907 to July 1, 1954. The bulletin is No. 1175 and can be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. for 30¢.

The summary points out that, except in 1922 and 1932-33, union wage rates for all building trades steadily rose each year over the 48-yr period at an annual rate of 4.4%. From 1922 to 1932 wages advanced steadily, increasing slightly more than a third during the ten-year period. A sharp decline in 1932 was not offset until 1938.

By 1941, when the full-scale war construction program began, union wages were about 10% above pre-depression rates. With wage stabilization during the war, wages went up about 23% between 1941 and 1946. However, in the period that followed — 1946 to 1954 — rates were substantially increased, averaging about 70%. On the basis of the Bureau of Labor Statistics study covering 52 cities, the 3.7% increase for the year ending July 1, 1954 represented the smallest since the end of the war.

The study also revealed that during the post-war period rates for laborers and helpers rose more than those for the journeyman

H. O. Penn Machinery Corp., New York, cleans Cat DW21's and other big rigs with Malsbary HPC cleaner. What's best size steam cleaner for you? Here's experience of Malsbary users...

Cleaning Load...Your Guide to Best Size Steam Cleaner

For Big Equipment and Tough, Steady Cleaning use a Malsbary HPC (high pressure combination) cleaner as H. O. Penn Machinery Corp. does. This Model 300 HPC cleaner delivers up to 1200 gallons per hour of cold water or hot solution with a 400-lb. impact. It blasts away sticky road tars and imbedded grease in a fifth of the time taken by Penn's previous cleaners. It also supplies hot water and steam for cleaning and degassing tanks, rinsing, de-icing, and thawing. Where work is more than one man can handle, this cleaner operates two cleaning guns simultaneously — one on cold water, one on hot solution.

Trailer mount enables Burns & Dutton to take cleaning right to job.

For Lighter and Intermittent Cleaning Jobs use a Malsbary 110 or 220 steam vapor cleaner as Burns & Dutton Construction, Ltd., Calgary, does for daily cleaning of mixer trucks. Same Malsbary 220 also heats water for winter use and cleans rigs before overhaul and painting.

For Parts and Light, In-Shop Cleaning use the small, new Malsbary 60. Its nozzle controlled, simple as a wrench to use, cuts repair time by eliminating hand wiping of parts. Only $395.

See your Malsbary jobber NOW for the right size cleaner for your needs...or write TODAY for literature on the full Malsbary line.

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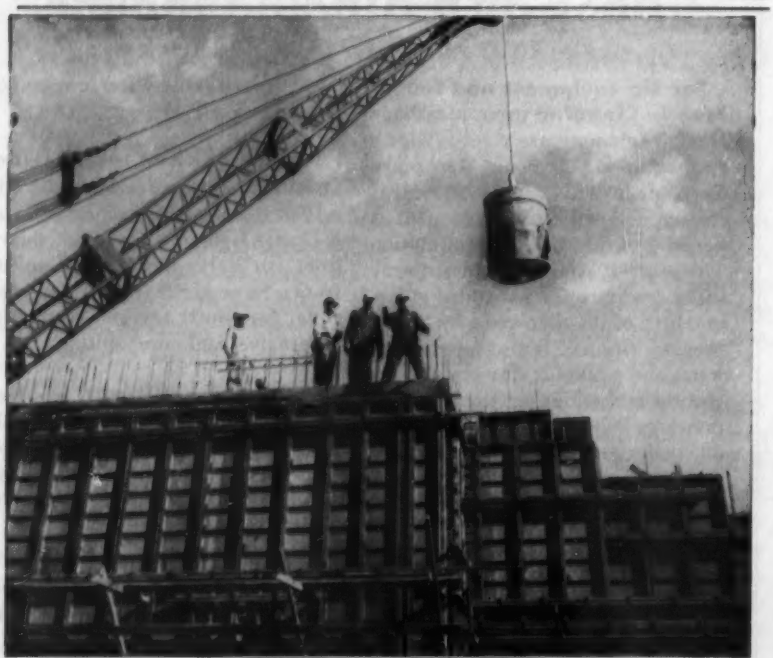
CLEARING HOUSE FOR MARINE DIFFICULTIES SINCE 1894.



3 Walers on 16' Wall

Henry Carlson Const. Co., Sioux Falls, S. D., used only 3 walers with Symons Forms on 16' high 12" thick wall for City Water Treatment Plant. 10,000 square feet of Symons Panels were reused 12 times on the job, resulting in savings of labor, material and fast forming. To pour these high walls certain upper panels were raised 1 foot to permit pouring through side openings for the first 8 feet of concrete.

Send the plans for your next job and get complete layout and cost sheets—no obligation. Catalog F-9 available on request. Symons Clamp & Mfg. Co., 4255 (H)5 Diversey Ave., Chicago 39, Illinois.

(Advertisement)

trades—83% compared to 67%. The narrowing of the differential in wages, the study pointed out, is characteristic of American industry as a whole.

Among the 52 cities studied, the Bureau found rates to be highest in Newark, N. J.; lowest in Charlotte, N. C. A standard work week of 40 hrs was found to prevail for seven-eighths of the journeymen workers and nine-tenths of the laborers and helpers in these cities.

For the first time in any survey, the Bureau included data for health, welfare and pension funds. It was found that substantially more workers are covered by welfare funds than pensions. Three-fifths of the workers studied were covered by welfare programs, and of this group 90% were covered by plans financed entirely by employer contributions.

Only about one-eighth of the workers included in the study were found to be covered by pension plans. Of this number, approximately two-thirds were under plans financed by employers only. About one-third were under plans jointly financed by employers and workers. Pension plans were most common for electricians, who have a national plan that has been in operation for years. Other trades where pension plans were found to be common were bricklayers, lathers, plasterers, plumbers, sheet metal workers and steamfitters.

A study of the charts and tables, apart from historical data on wages and hours, also will indicate trends in wage increases, and welfare and pension plans that should be of great value to contractors who negotiate with the building trades unions.

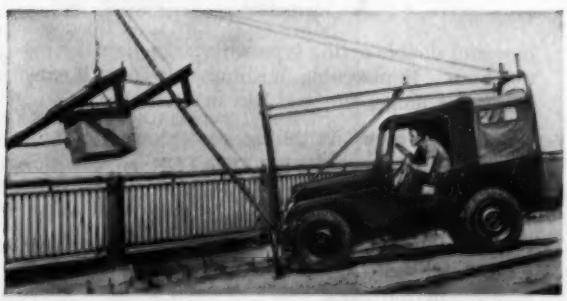
Panel Safety Nets on Golden Gate Bridge

Work of strengthening the Golden Gate bridge by Judson-Pacific Murphy Corp. was made safer by 52x110-ft panel safety nets under the span.

The Pedley-Knowles nets are made of premium grade pure manila rope with no short rope members. The mesh is 6 in. with a ¾-in. ridge rope. Fiberglas roving, impregnated with polyester resin plastic, is used to tie each intersection of the mesh, as well as to secure the mesh to the ridge rope.

Goes anywhere! The Universal 'Jeep' is often the first equipment to reach a construction job, and the last to leave. With the extra traction of its 4-wheel drive, it takes engineers over the roughest ground for first surveys. During construction it carries men and tools wherever they are needed, on or off the road. And when the job is done, it helps speed final inspection work.

How 4-wheel drive 'Jeep' vehicles help contractors save time and money!



'Jeep' with hoist lowers lighting equipment in a bridge deck installation. Because of its light weight, the 'Jeep' can haul materials over new concrete before it is strong enough to support heavy trucks.

'Jeep' Truck with hydraulically-operated back hoe prepares foundations, digs laterals or drainage ditches, and does other jobs too big for hand digging but too small for heavy-duty earth-moving equipment.

Vehicles in the 'Jeep' family help speed work and cut costs in almost every phase of construction.

In 4-wheel drive they go up steep grades—through mud, sand and soft earth—where other vehicles can't go. They shift easily into 2-wheel drive for travel at highway speeds. With power take-off or hydraulic lift, they operate many types of equipment from dozer blades to mobile drills for soil sampling. They stand up to the toughest usage—save you valuable time on job after job. Ask your nearest Willys dealer for an on-the-job demonstration or write for information.

The 'Jeep'®

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WILLYS... makers of the world's most useful vehicles

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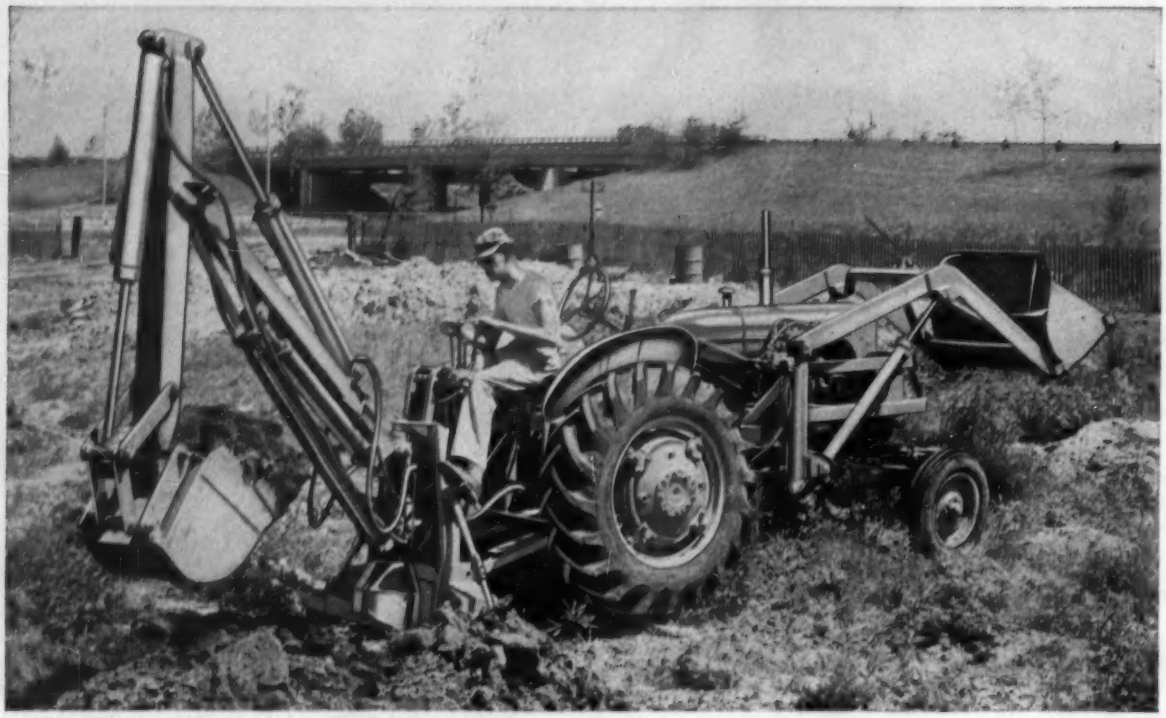

The Allis-Chalmers WD-45 Tractor and Henry Backhoe

Handyman around any construction job

45 belt hp — gasoline engine
Weight, 6,100 lb
10-ft 6-in. digging depth, 13-ft 10-in. reach with telescoping boom
8-ft digging depth, 12-ft 4-in. reach with standard boom
Loading height, 8 ft
Swing arc, 160 degrees

Mobility and Versatility keep the WD-45 with backhoe busy on a wide range of jobs — digging ditches, trenches, culverts, footings, foundations, and on backfilling. This unit is mobile enough to reach even the hard-to-get-at places — has the power and strength to help out on big operations — is small enough to work economically on the low-yardage jobs — get maintenance and clean-up work done fast.

Greater Working Range is now available with the Henry telescoping boom — digging depth of 10 ft 6 in. and reach of 13 ft 10 in. To widen the job range, there are seven interchangeable buckets, 12- to 24-in. width, front-end loader, and backfill blade attachments.

More Work Capacity because heavy-duty backhoe assembly is all-steel, box channel construction to take rough, hard use. All-hydraulic cylinders are powerful double-acting type with large-diameter piston rods. Replaceable bushings are on all wear points for longer life and less maintenance.

Long-Life Power. With big power output at low piston speed, the POWER-CRATER engine gives dependable, high-output performance on the tough jobs. Full-pressure lubrication, exhaust-valve rotators, removable exhaust valve seat inserts, and removable "wet" type cylinder liners contribute to long-life performance.

Operating Advantages help do a more efficient job in less time. Two-clutch control lets the operator make short moves while digging, with easy-to-reach hand control. Power-Shift rear wheels permit quick, easy shifting to wider wheel tread in soft footing or whenever more than normal tread is required for increased stability.

CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

POWER-CRATER is an Allis-Chalmers trademark

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SALES AND ★ SERVICE ★

News of manufacturers' activities designed to assist the reader in the purchase of machinery, equipment and materials and help him obtain quick service on parts and maintenance.

Distributor Appointments

Chain Belt Co.: Announces the appointment of Pioneer Equipment Co. of Nevada Inc., Reno, Nev., as exclusive distributor for Rex construction machinery equipment in Nevada except for the counties of White Pine, Elko, and Clark. Also for the following California counties: Alpine, El Dorado, Placer, Nevada, Sierra, Plumas, and Lassen.

Huber-Warco Co.: Announces the appointment of Euclid-Arkansas, Inc., North Little Rock, Ark., as a distributor of its complete line of tandem rollers, three-wheel rollers and graders. Also announced as a distributor is the Foulger Equipment Co. of Salt Lake City, Utah.

The Heil Co.: Bowyer Motor Co., Inc., Tucson, Ariz. is now distributing Heil truck body and hoist equipment in Mexico, representing the Milwaukee company in the states of Sonora, Sinaloa, and Baja.

The K-G Equipment Co., Inc.: Has selected these distributors for their industrial equipment: D&R Welding Supply Co., Streator, Ill.; Gano Welding Supply Co., Charleston, Ill.; Burton C. French Co., Mansfield, Ohio; Keeler Steel, Inc., Minneapolis, Minn.; Mercury Welders Service, Norfolk, Va.

LeTourneau-Westinghouse Co.: Richmond Machinery & Equipment Co., Inc., Richmond, Va., has been named distributor of this company's equipment, including motor graders and TraveLoaders of the firm's Adams division, serving the Commonwealth of Virginia, with the exception of Frederick, Clarke, Louden, Fairfax, Prince Williams, Arlington, Northampton and Accomac counties. The new western Iowa distributor is Vivian Equipment Co., Ames, Iowa.

Clark Equipment Co.: Six new dealers have been appointed to sell and service the Michigan line of tractor shovels and excavator cranes, products of the Construction Machinery Div. The dealers and their territories: Stephens Equipment Co., Des Moines, Iowa, for central Iowa; R. E. Common Equipment Co., Peoria, Ill., for west-central Illinois; Machinery Outlet, Inc., Wichita, Kan. for central and western Kansas; Totem

How do YOU cut BOLTS?

When you get to 1/4 inch and larger — do you cut the hard way or the easy way? This book compares the cost of hand tool metal cutting both ways—cutting

- 3/4" bolts — hard or soft
- 3/4" chain
- 5/8" rod
- steel strapping, flat or round stock, insulated cable, wire rope, etc.

in the shop or out on the job with hand power. WRITE for this book today — it shows you how to save money.

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Somerville 43, Mass.

Please send me my copy of
"CUTTING METAL THE EASY WAY".

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In Shipbuilding as in other great industries

MILLER WELDERS are preferred

St. Louis Shipbuilding and Steel Co., largest builders of inland towboats in the world, require welds that will withstand a maximum amount of abuse.

Look anywhere in St. Louis Shipbuilding's mammoth yard and you will see Miller Selenium Rectifier type D.C. arc welders—in single units or in batteries of four and five for greater output.

For dependable welds, St. Louis Shipbuilding prefers the Miller S.R. welder. Miller is glad to be aboard.

ARC • SPOT miller GENERATORS WELDERS

Miller Selenium Rectifier type D.C. Arc Welders are available in four wide range models. For complete information on these and other Miller arc and spot welders, contact us today at no obligation, of course.

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MILLER Tilt-Top!

* Model "B" 10 Ton $1175.*

Optional equipment (priced extra): 16' long platform (8 x 14' standard) Hydraulic tilt control, 2 speed hand winch and electric brakes.

*FOB Milwaukee, Plus 8% Federal Tax

With this big Tilt-Top, ONE man can load, or unload in less than TWO minutes! It cuts your loading time ups your PROFIT time. Get this big help now it's built to last, yet volume priced for less!

Miller Tilt-Top Trailer Co.

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SALES AND SERVICE . . .

Continued

Equipment Co., 3706 Airport Way, Seattle, Wash., for Washington (except for five southwest counties) and northern Idaho; West Virginia Tractor and Equipment Co., Charlestown, W. Va., for West Virginia with the exception of the counties of Marshall, Ohio, Brooke, Hancock, Morgan, Berkeley and Jefferson; Barker Equipment Co., Fredericton, New Brunswick, Canada, for the province of New Brunswick.

Frank G. Hough Co.: Metalweld, Inc. (Construction Equipment Division) has been appointed exclusive distributor for "Payloader" wheel tractor shovels and industrial tractors in eastern Pennsylvania, southern New Jersey and New Castle, Del.

Pioneer Engineering Works, Inc.: Butler Machinery Co. of Fargo and Grand Forks, N. D. has been appointed a distributor of the Continuflo line of equipment. The company, with main offices in Fargo, will serve the entire state of North Dakota.

Superior Cement Tool Co.: United Sales Co., New York, has been appointed exclusive sales agent in eastern United States and eastern Canada for the Superior cement finishing machine.

Bucyrus-Erie Co.: R. J. Fyfe Equipment Ltd., Regina, Saskatchewan, Canada, has been appointed distributor for the entire Province of Saskatchewan.

Wonder Building Corporation of America: The Atlas Wonder Building Sales Co. has been appointed metropolitan Chicago and Cook County distributor for this company's line of trussless, pre-fabricated steel buildings.

Cleaver-Brooks Co.: Has named the Powell Equipment Co. as manufacturer's representative for the sale of Cleaver-Brooks boilers and equipment. Located in Houston, Tex., its territory will include 29 counties in southeast Texas surrounding Houston.

Maginniss Power Tool Co.: Appointment of several new distributors is announced: Herman M. Brown Company, Des Moines, will serve the state of Iowa; Mid-State Massena, Inc., Massena, N. Y., in northern New York state; Central New York state has been assigned to Mid-State Contractors' Equipment Co., Syracuse; West Coast Engine and Equipment Co., Berkeley, Calif., will act as central and northern California

(Continued on page 157)

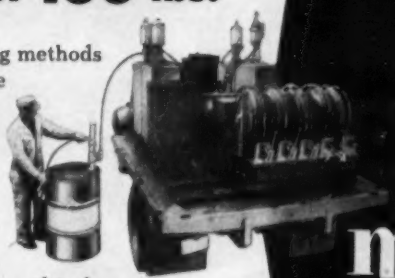
1. Alemite Loader Pumps . . .

save 3¾ man-hours for every 100 lbs. of grease!

Alemite Loader Pumps put an end to slow, messy, hand loading of grease guns. They make sure *clean* grease is delivered to bearings, free of dust and grit that can cause a costly breakdown. Just a few strokes fill the gun with refinery-fresh lubricant. Models to fit and seal any original container – from a 400 lb. drum to a 25 lb. pail. Shown: Model 7181-L "Red-A" Loader Pump.

2. Alemite Power Transferring . . .

saves up to 63% of man-hours per 100 lbs.



Alemite *Power* transferring methods save important time – give vital protection! Here an air-operated Alemite Gusher Pump, Model 7216-A, refills lubricant tanks on a portable service station . . . transfers 37 pounds of pressure gun grease in just 60 seconds! Fits and seals original refinery drum . . . completely protects lubricant every step of the way!

3. Alemite Portable Service Stations . . .

save up to 95 man-hours for every 400 lbs. of grease!

Bring all the advantages of a complete lubrication department right to equipment in the field! No time lost – no more costly breakdowns due to improper or insufficient lubrication. Portable Service Stations provide all standard maintenance services – pressure gun grease, gear lube, oil, air and water. Save time, money, equipment!

Proof!

Alemite lubrication methods save time...money ...equipment!

Alemite In-The-Field Lubrication helps meet tight time schedules ...saves three ways!

ALEMITE, Dept. F-85,
1850 Diversey Parkway, Chicago 14, Illinois

Gentlemen: Please send me FREE information on Alemite lubrication methods that can save me money, plus FREE illustrated booklet on Alemite Portable Service Station and Alemite Equipment.

Name.....

Company.....

Address.....

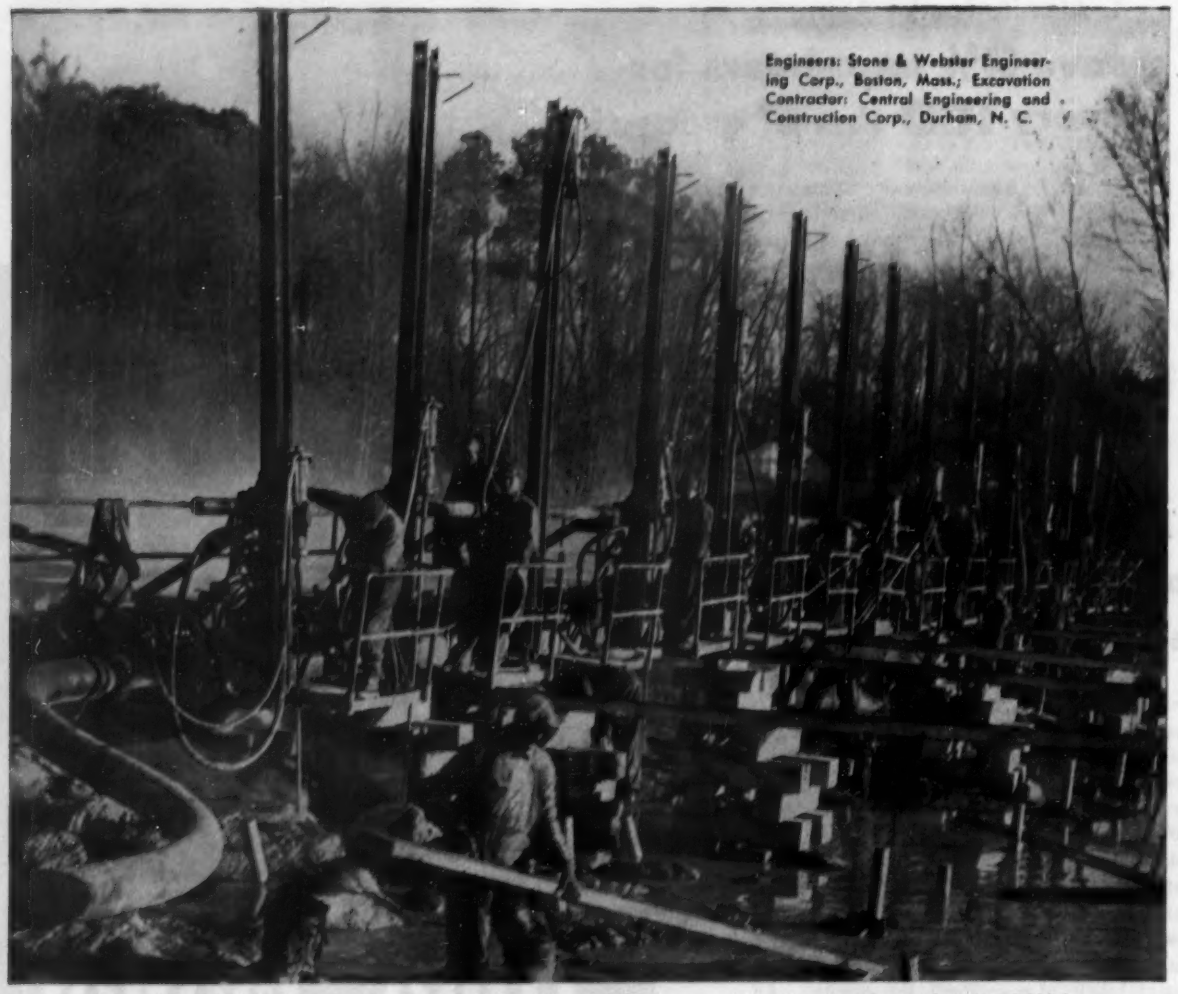
City.....State.....

ALEMITE

REG. U. S. PAT. OFF.

Ask Anyone In Industry

A PRODUCT OF SW STEWART-WARNER



Engineers: Stone & Webster Engineering Corp., Boston, Mass.; Excavation Contractor: Central Engineering and Construction Corp., Durham, N. C.

This rail-mounted drill carriage, equipped with Bethlehem Hollow Drill Steel, was used in making blast holes for first lift of 8,000-ft tailrace for Roanoke Rapids Dam in North Carolina. Tailrace is part of hydroelectric project for Virginia Electric & Power Co.

Solid Granite . . . 1,000,000 cu yd of it . . . Blasted for 8,000-ft Tailrace

Excavating an 8,000-ft tailrace, 80 ft wide and from 56 to 31 ft deep, would be a difficult enough task even in relatively soft earth. But when it calls for the removal of more than a million cu yd of solid granite, the project assumes gigantic proportions.

That was the problem confronting engineers for the new Roanoke Rapids Dam, at Roanoke Rapids, N. C. This huge structure is part of a hydroelectric project for Virginia Electric & Power Co. The lengthy tailrace was planned to obtain full hydraulic advantage from the long rapids at minimum cost.

Bethlehem Hollow Drill Steel, fitted with carbide-insert bits, was used in the rock-removal operations. To speed the work, the drill carriage illustrated, mounting 14 wagon drills, was used to drill blast holes for the first lift through the tailrace's entire length. The holes, on 5- to 7-ft centers, were drilled 24 to 30 ft deep. After mucking, individual wagon drills were used to make blast holes in the second and third lifts, because of the uneven surface.

Bethlehem Hollow Drill Steel is ideal for steady, economical drilling because it is rolled from a top-quality grade of fatigue-resisting steel. It has a wide quenching range, and is easy to heat-treat for the ideal balance of hardness and wear-resistance. It also makes long-wearing threads and tough shanks.

Bethlehem Hollow is available in rounds, hexagons and quarter-octagons, and is generally furnished in lengths ranging from 18 ft to 25 ft. It is also supplied in longer lengths, to meet special requirements. It's good steel to keep in mind for your next drilling job!

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM HOLLOW DRILL STEEL

BETHLEHEM STEEL

SALES AND SERVICE . . .

Continued from page 154

distributors of Maginniss products. Two affiliates of West Coast Engine and Equipment Co. will also handle the Maginniss line: Island Equipment Co., Sacramento, and Equipment Sales and Service Co., Stockton.

ON THE SALES FRONT

Hercules Powder Co.: Carl W. Eurenius, director of sales for the Cellulose Products Department, has been appointed assistant general manager of the department. Werner C. Brown succeeds Mr. Eurenius as director of sales.

Marion Power Shovel Co: Walter Pierson has been appointed southeastern sales manager with headquarters in Atlanta, Ga. The new northeastern sales manager is Paul Fenwick who will continue to make his headquarters in New York City. Robert Campello is the new sales manager in charge of sales of all Marion machines sold through distributors in the United States and Canada.

Detroit Diesel Engine Div., General Motors Corp.: Has appointed Royce A. Hill manager of Florida diesel engine sales, covering most of the state of Florida.

The Cleveland Vibrator Co.: Announces that L. P. Metesser, their west coast representative, has added the states of Idaho, Utah and Arizona to his territory handling the complete line of vibrating equipment.

Pittsburgh Corning Corp.: George O. Otis has joined the sales staff in the Minnesota, Wisconsin, North Dakota, South Dakota and Iowa area and will supervise the distribution and sales promotion of Foamglas industrial insulation and Foamglas low-temperature insulation. His headquarters will be in Minneapolis, Minn. James G. Archibald is the new sales representative for the company's Kansas City office.

Gorman-Rupp Co.: Robert L. Sears has been named South-Central District Representative covering the lower Mississippi Valley and Delta areas.

Gradall Div., The Warner & Swasey Co.: Four branch office personnel changes have just been announced: W. C. Worthington has been transferred to the Philadelphia office and promoted to district manager for that territory which includes Penn-

Compacting sub-base on the Ohio Turnpike.

DO IT FASTER — BETTER and CHEAPER with the JACKSON VIBRATORY COMPACTOR!

MACADAM CONSTRUCTION: All around the country on major paving projects the JACKSON VIBRATORY COMPACTOR is being hailed as the most advantageous equipment ever developed for achieving specified density in rock, slag, soil-bound macadam, gravel and sand base courses. Uniform compaction to final density is obtained in rock macadam courses up to 12" in minimum time. The dry fines are quickly vibrated into all voids, filling them chockfull, solidly, from top to bottom of the course. Standard width is 13',3". Working speeds up to 60 FPM, reverse travel: 5½ MPH.

SUB-BASES, GRANULAR SOIL-CEMENT PAVING and SAND FILLS: It is equally efficient on gravel sub-bases and granular soil-cement paving or base course construction. And it's a bear-cat for compacting sand fills such as bridge approaches, since it quickly achieves desired density and individual units may be subtracted and even fitted with operating handles to suit every condition and to get into the really tight places.

PAVEMENT WIDENING: In any granular material used in flexible base course widening specified density is accomplished in one pass with the compacting units towed in tandem at the side of the tractor. Interchangeable bases from 12" to 26" wide may be substituted for standard 26" bases to suit requirements.

By all means investigate this time and money saving equipment

FOR SALE OR RENT AT YOUR JACKSON DISTRIBUTOR

JACKSON VIBRATORS, INC.

LUDINGTON, MICHIGAN

RAISED STEEL MARKINGS
for long wear and easy reading

2F

NEW, IMPROVED
LUFKIN CHROME CLAD
SUPER HI-WAY
DRAG TAPE

Lufkin's Super Hi-Way drag tape is better than ever! The strong, top quality steel line now has raised markings surrounded by raised protecting borders that greatly increase the life of the tape. Both markings and borders are an integral part of the line, further strengthened and protected by the Chrome Clad finish of multiple electroplatings, which resists wear, rust, and corrosion. The new Chrome Clad satin white raised markings against the jet black background are extremely easy to read.

Available in 100', 200', and 300' lengths with heavy reinforced end rings and two thongs. Sturdy reels have long, folding winding handle. Railroad half-gage marked on all tapes. All types of end markings available.

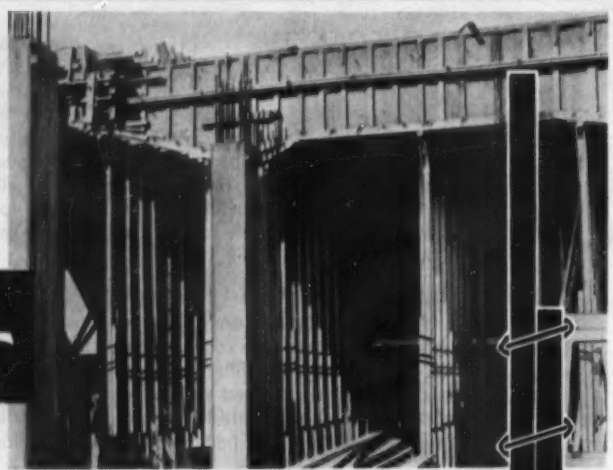
BUY LUFKIN TAPES • RULES • PRECISION TOOLS FROM YOUR SUPPLY STORE

345

THE LUFKIN RULE COMPANY, Saginaw, Michigan
132-138 Lafayette Street, New York City • Barrie, Ontario

Shoring on Vernon Ave. Bridge in New York City Easier with

Elis SHORES



Elis Shores 22' high, with 3 clamps instead of 2, provide the answer to this heavy beam problem.

Shore Requirements Varying from 2' to 25' Accomplished with Elis Adjustable Shores

On both the approaches and the draw spans, Elis Shores proved their adaptability, as shore heights varied from 2 to 25 feet. For bridge construction, such as the Vernon Avenue Bridge in New York, Elis Shoring Methods reduce the cost of concrete forming, while giving a greater margin of safety. Write for further details.

MFD. BY ELIS EQUIPMENT CO., INC., 211 N. W. 4th ST., OKLAHOMA CITY, OKLA.

SALES AND SERVICE . . . Continued

sylvania, Maryland and Virginia. Russell Dessecker, formerly service representative for the Gradall Atlanta territory, becomes field engineer for that territory. Richard Bair has been promoted to field engineer and together with Mr. Dessecker will cover this territory which includes Tennessee, Georgia, North and South Carolina, and Florida. S. O. Adams has been promoted to field engineer. His territory includes New Mexico, Texas, Oklahoma, Arkansas, and Louisiana.

Circle Clamp Corp.: Ernest A. Magyar has been appointed sales engineer to work with distributors of the company's all-purpose hose clamps all over the country.

Joy Manufacturing Co.: Has appointed L. G. Felderman sales manager, rock mechanization with headquarters at the company's Franklin, Pa. plant. Mr. Felderman will specialize on trackless mining products for hard rock and tunnel applications.

Certain-teed Products Corp.: Carl E. Berzelius has been appointed general sales manager to direct national sales of Certain-teed's asphalt roofing, gypsum, insulation and paint products to the building and industrial fields.

Harnischfeger Corp.: Announces the appointment of James C. Huntington as district manager in the New York office. He succeeds Robert Grant who resigned to enter into partnership with Johnson & Dealaman, Inc., P&H power crane and shovel distributors in Newark, N. J.

In the Main Office

Crane Co.: Frank F. Elliott, senior vice-president of sales since 1952, has been elected president and chief executive officer of the company.

The White Motor Co.: Announces the appointment of Karl A. Roesch, director of service, as general manmanager of the company's Autocar Division, located in Exton, Pa.

Borg & Beck Div., Borg-Warner Corp.: The election of Harold Nutt as president and general manager has been announced. He previously was vice-president and general manager.

Four Wheel Drive Auto Co.: John G. Thompson has been named director of parts and services. His position is a new one coordinating the direction of the parts and service departments.

(Continued on page 16)

POSITIVE EJECTION WITH A 140,000-LB. PUSH!

QUICK & CLEAN...Caterpillar DW21 powered MOVALL dumps mucky mud and rock mixture whistle-clean in 12 to 14 seconds on Geo. M. Brewster & Son's New York Thruway job, near West Nyack, New York.

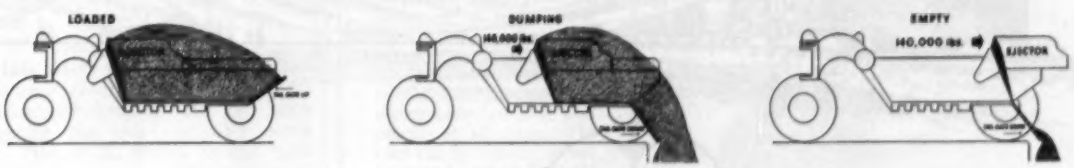
C & D MOVALL's "scraper-in-reverse" design puts a 140,000-pound push behind the ejector for unloading. This gives you positive ejection and controlled dump or spread for handling any material you can load with shovel, dragline or belt loader. MOVALL can place the load where and how you want it... over the edge of a fill, spread in even lifts of any desired depth, or into hoppers at a controlled rate. The 140,000-pound push scrapes the bowl whistle-clean, even in mud, gumbo, or frozen ore.

3 BIG ADVANTAGES

The MOVALL offers you the widest work range of any hauling unit available today, enables you to: (1) "tool up" for more types of work for less money; (2) keep your MOVALLS busy on jobs where special-purpose hauling units stand idle; (3) use same Cat DW20 or DW21 prime movers for both scraper and top-loading jobs.

C & D MOVALLS are available for Cat DW20 and DW21 tractors; handle 31-ton, 25 cu. yds. (heaped) loads of any material you can top load. They cost no more than comparable-size limited use wagons; they pay off on many more types of work. See your Caterpillar - C & D dealer, or wire us now about a MOVALL demonstration on your job. C & D MANUFACTURING COMPANY, Perkins (suburb of Sacramento), California; phone HIllcrest 5-8592.

#5



HOW IT WORKS

Movall uses standard cable scraper power control. To dump, operator releases backhaul drum to drop tailgate, engages ejector drum. Eight-part ejector line gives 140,000 lb. push to boost load out fast and clean. Operator has complete control of discharge, controls spread depth by varying travel speed. After dumping, backhaul line closes tailgate and rolls ejector to loading position.

MORE PULL WITH LESS FUEL!

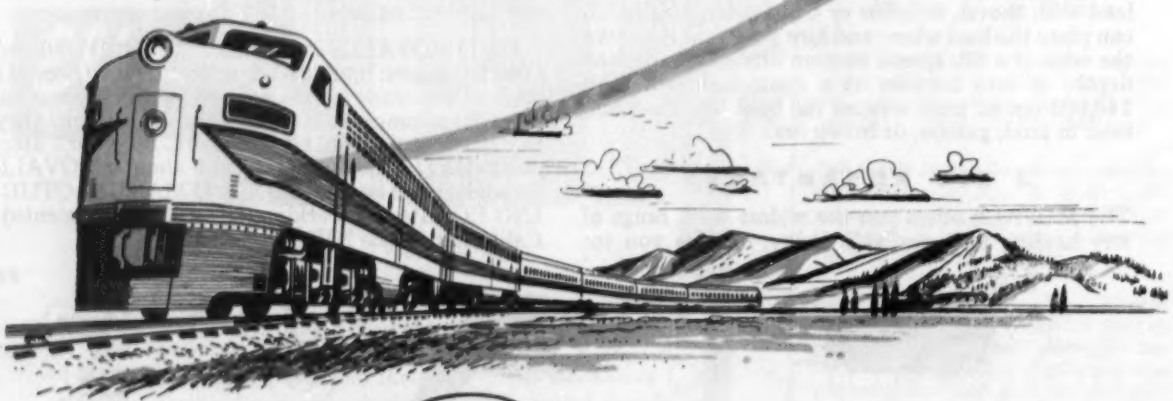
AiResearch Turbochargers provide rapid response to acceleration demands... end objectionable smoking!

Consider what the application of AiResearch Turbochargers to diesel locomotives will accomplish: A team of these small power packages will provide a greater increase in power at smaller cost in space and weight than any comparable turbocharger or supercharger installation.

In addition, specific fuel consumption on a horsepower per hour basis will be far less. Sea level performance will be restored within operating limits at altitude, response to acceleration demands will be rapid and excessive smoking under operating power eliminated. Also, the noise level will be greatly reduced.

Application in other fields will be equally effective, as has already been demonstrated in the remarkable results achieved by the installation of AiResearch Turbochargers on Caterpillar diesel machinery.

AiResearch is the largest producer of small turbomachinery in the United States, with twenty-five *million* hours of experience. This unmatched experience explains why AiResearch Turbochargers lead in power, economy and dependability.
Your inquiries are invited.



THE GARRETT CORPORATION

AiResearch Industrial Division

9225 Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND RELATED MACHINERY

SALES AND SERVICE . . .

Continued from page 158

The Cleveland Formgrader Co.: Glen Mooney has been appointed president of this company which manufactures paving equipment.

Gar Wood Industries, Inc.: Milton G. Peck is the new vice-president and director of sales and advertising. He was formerly sales manager of the electric industrial truck division of Clark Equipment Co.

Butler Bin Co.: Announces the recent election of Kenneth P. Kerr, vice-president in charge of sales, and Morgan Robert Butler, Jr., vice-president in charge of production.

Dart Truck Co.: George F. Dixon, Jr., is the newly elected president, succeeding Furber Marshall, former non-resident president, who becomes chairman of the board of directors.

Certain-teed Products Corp.: Malcolm Meyer has been elected president succeeding Rawson G. Lizars who continues as chairman of the board.

Keystone Roofing Mfg. Co.: Richard E. Henle has been appointed plant manager. He also will be in charge of a plant modernization program, the first phase of which will be completed during 1955.

United States Rubber Co.: G. Allen Lovell has been elected a vice-president and appointed general manager of its mechanical goods division.

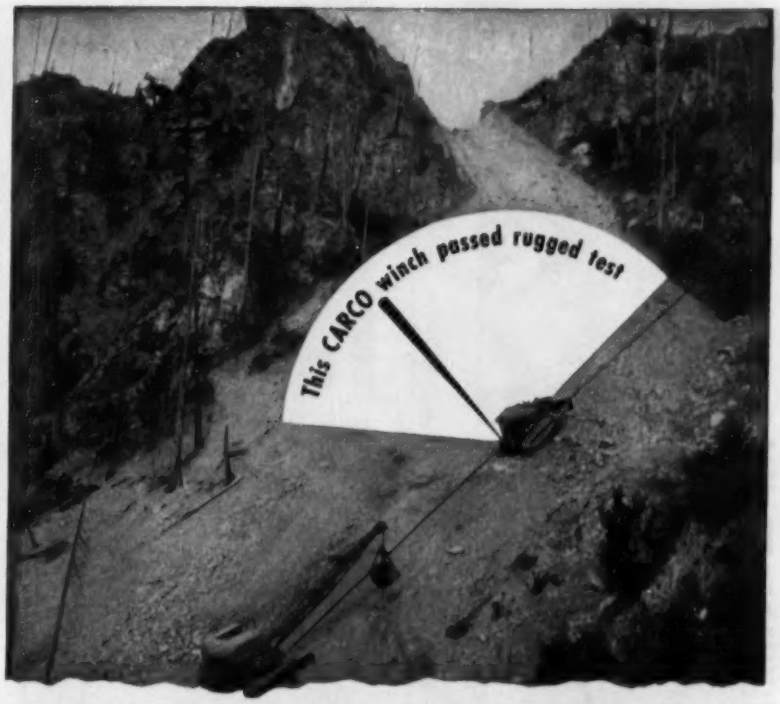
Allegheny Ludlum Steel Corp.: Richard J. Swan has been appointed director of sales, magnetic and electronic materials, and Milton M. Fenner, Jr., has been appointed director of sales, tool and die steels.

Bosworth Mfg. Co.: Glen Mooney has been appointed president of this company which makes a full line of conveyor systems, both standard and custom-engineered.

Aluminum Industries, Inc.: Has announced the appointment of Thomas L. Humble as vice-president and general manager in charge of production.

Crucible Steel Co. of America: Has appointed George F. Groff vice-president of finance. He has been controller for the company since 1953. Daniel A. Porco is the new controller.

Midland Industries Inc.: Ellis G. Cram has been elected president succeeding the late Don M. McIntyre. Mr. Cram previously was vice president and sales manager.



CARCO winches held fast when slippage meant disaster

. . . on tough Alberta to Vancouver pipeline job

Towing and holding heavy equipment on steep grades is a severe test of a winch brake. On the Model J Carco winch, the automatic, self-energizing brake will hold any load the winch can pull. It takes hold the instant tractor clutch is disengaged. Full braking power comes from high ratio leverage contracting the band on brake drum. Brake unit is reversible, permitting under- or over-wind free-wheeling. Brake release mechanism gives the operator complete load control at all times. The load can be checked at any point and even be "inched" down. Brake is enclosed, protecting it from the elements or external abuse.

Mr. G. T. Guest, Assistant to Project Manager of Comstock Midwestern, Limited, builders of "Big Inch-by-Inch", says, "The job needed Carco winches for towing and holding heavy machinery on steep grades and even for holding men by life lines. Had a single winch failed, men and machinery would have been lost. We found Carco winches equal to everything we asked of them."

On top of hill a Model J Carco winch is winching the Carco J winch and International TD24 shown above up steep slope at Coquihalla Canyon while it, in turn, is winching up clam digger.

You can expect greater value from the leading producer, and get it from Carco, first in winch production. PACIFIC CAR AND FOUNDRY COMPANY, Renton, Wash. Branches at Portland, Ore., and Franklin Park, Ill.

50TH ANNIVERSARY PACIFIC CAR AND FOUNDRY COMPANY

CARCO

WINCHES

FOR ALL INDUSTRIAL TRACTORS

INDIAN

DRINKING WATER & SUPPLY TANK NO. 75G

Replaces unsanitary bucket and dipper. Portable. Push button faucet. Takes cold, clean water to workers right on the job 5 gal. steel tank is curved to fit the back. Sturdy construction. Highly popular.

E-Z

5 gal. Knapsack Sprayer

For spraying oil on machinery and equipment to prevent rust, etc. 4 to 5 gal. capacity. 24 inch brass extension with brass adjustable nozzle for long or short distance spraying.

Send for circular

DISCOUNT IN QUANTITY LOTS

D. B. SMITH & COMPANY

"Choice for Quality the World Over"

450 Main St. Utica 2, New York

Save TIME! SPEED WORK!

Katolight

PORTABLE POWER PLANTS

Your crews can have "plug-in" electricity anytime, anywhere with Katolight Power Plants. Operate all types of electrical tools, equipment and lights. Sizes and models for every portable or standby need from 350 Watts to 50,000 K.W., A.C. Up to 400 K.W. on request.

Model at right available equipped with accessories to fit your needs.

NEW FOLDER *Write Today!*

DEPENDABLE ELECTRICAL EQUIPMENT SINCE 1928

Katolight CORPORATION

Box 891-106 Mankato, Minn.

SALES AND SERVICE . . .

Continued

Pettibone Mulliken Corp.: Herbert J. Knudten, president of Universal Engineering Co., Cedar Rapids, Iowa, has been elected vice-president of the concern's parent company. Knudten will continue in his present capacity at Universal and maintain residence at Cedar Rapids.

Henry Disston & Sons, Inc.: John D. Thompson has been elected president, according to the announcement made recently by Jacob S. Disston, Jr., newly elected chairman of the board.

Allis-Chalmers Mfg. Co.: Appointment of R. B. Fulton as manager of the Cincinnati district of the company's general machinery division has been announced.

Detroit Diesel Engine Div., General Motors Corp.: Appointments of Charles W. Frederick as director of engineering and Clyde W. Truxell, Jr. as works manager have been announced.

D. W. Onan & Sons Inc.: Has announced the appointment of Hiram Hascall vice-president in charge of sales.

Carboloy Dept., General Electric Co.: Frank M. Mansfield III, manager of product programming, has been appointed manager of product planning and marketing research.

The Gallon Iron Works & Mfg. Co.: William R. Troper has been made supervisor of sales and service training for motor graders and rollers.

Special Mention

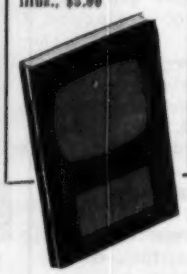
Textron American Inc.: Announced yesterday the purchase of the Homelite Corp. of East Port Chester, Conn. Homelite Corp. will be an independently operated subsidiary of Textron American Inc. without change in management, personnel or policy.

The Garrett Corp.: Announces its entry into the industrial field with the formation of its new AiResearch Industrial Division. A companion announcement that the corporation is currently producing new type turbochargers for application to heavy-duty diesel engines, followed a multi-million dollar order from the Caterpillar Tractor Co. of Peoria. The Industrial Division is headed by G. S. Williamson, a vice-president of The Garrett Corp. Present headquarters are in Los Angeles, but in the near future will be moved to Inglewood, Calif.

SIMPLIFIED MASONRY PLANNING and BUILDING

Just Out

A practical manual on planning and building all common types of concrete, concrete block, stucco, and similar structures. Step-by-step explanations cover foundations, walls, floors, etc., all according to building code requirements, and simple enough for inexperienced mechanics or homeowners to understand. **By J. Ralph Dalzell. 344 pp., 187 illus., $5.00**



BLUEPRINT READING for HOME BUILDERS

Just Out

Self-study manual for everyone in the building industry. Develops practical know-how with a new idea of "seeing" architectural features. Forms an orderly habit of approaching house plans and reading details step by step. Includes complete house plans, and covers all views, survey and plot plans, written specifications, etc. **By J. Ralph Dalzell. 146 pp., 61 plates on large format, $5.50**

CARPENTRY for the BUILDING TRADES

Concise handbook discusses every detail of small residence and frame house construction, giving instructions and diagrams for each operation. Covers methods that meet FHA requirements. Gives best practices for framing, bracing, roofing, etc., and advantages of each method. Second Edition covers construction of picture windows, plywood interiors, flat-type roofs, and other modern home features. **By E. A. Lair, Instructor, Building Trades. 2nd Ed., 310 pp., 226 illus. $4.75**

RADIANT HEATING

Practical semitechnical manual describes how radiant heating works and how it is applied in commercial building and private residences. Included are discussions of theory of radiant heating, types of material and equipment, use of radiant heating for cooling, adaptation of heat pump in radiant installations and use of radiant heating in swimming pools and other outdoor installations. Second edition includes new material on installation methods and design techniques. **By R. W. Shoemaker, Consulting Eng'r on Radiant Heating. 2nd Ed. 352 pp., 261 illus. $7.00**

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Send me book(s) checked below for 10 days' examination on approval. In 10 days I will remit for book(s) I keep, plus few cents for delivery costs, and return unwanted book(s) postpaid. (We pay delivery costs if you remit with this coupon—same return privilege.)

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- ☐ Dalzell—**Blueprint Reading**—$5.50
- ☐ Lair—**Carpentry**—$4.75
- ☐ Shoemaker—**Radiant Heating**—$7.00

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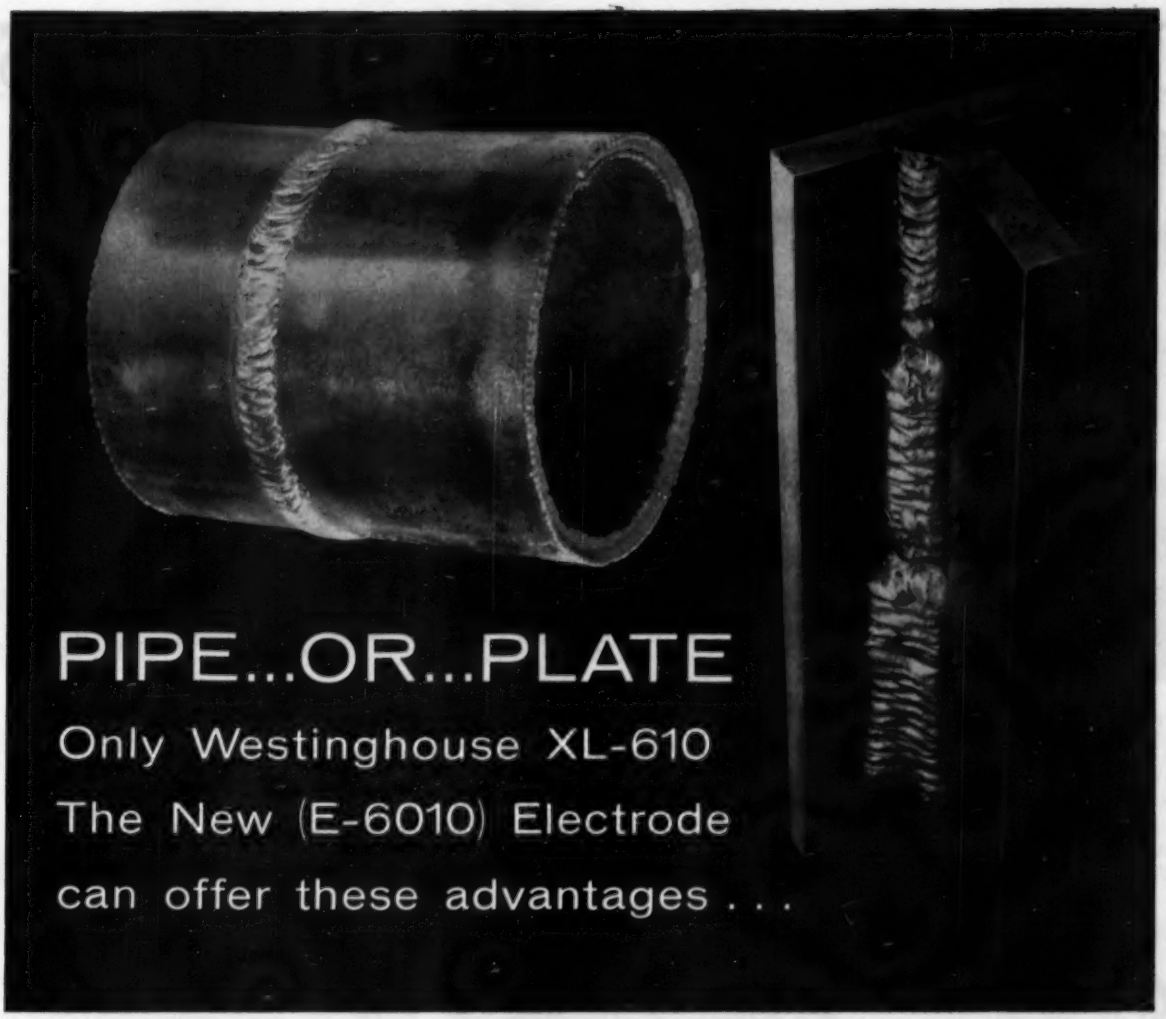


- Pinhole-free, x-ray quality welds in any position. Fewer rejections, faster production, better quality work.
- Feather-touch slag removal—cleaning time reduced to an absolute minimum.
- Deep penetration for root pass welds. Makes XL-610 especially suited to heavy plate fabrication, pipeline, shipyard, pressure vessel and construction work.
- Extremely low spatter loss, even with high currents. Higher deposition rates, easier cleaning.
- PLUS these exceptional "physicals". . .

J-21911

YOU CAN BE SURE...IF IT'S Westinghouse

ABS Specifications	Westinghouse XL-610		
	1/2"	3/8"	1/4"
Percent elongation in 2" . . 22%	28	28	34
Yield strength, psi 50,000	52,900	54,800	53,800
Ultimate strength, psi . . . 62,000	65,900	64,500	62,400

WESTINGHOUSE ELECTRIC CORPORATION
Welding Dept., Box 868
Pittsburgh 30, Pa.

Gentlemen: Please rush full information plus samples on new Westinghouse XL-610.

Name_____ Title_____
Company_____
Street & No._____
City_____ Zone____ State_____

CONSTRUCTION EQUIPMENT NEWS

Big Crane is Maneuverable

LeTourneau's MB-1 crane combines maneuverability with 40-ton lift capacity. Powered by a Buda 325-hp engine, the crane, with an over-all length of 75½ ft, can travel at 40 mph, make 180-deg. turn in 47 ft. Maximum lift is 32 ft, and maximum reach is 28 ft.—**LeTourneau-Westinghouse Co., Peoria, Ill.**

Payloader Gets Power-Shift

A 2-yd tractor shovel, similar in design and performance to its 1- and 1½-yd predecessors, has been added to the Hough Co. Payloader line. The model HO also features a power-shift transmission which shifts through all speeds, forward and reverse, without slowing down.—**The Frank G. Hough Co., Libertyville, Ill.**

Short Turning Radius

A ⅜-yd shovel-crane with a short self-propelled turning radius has been developed by Schield Bantam Co. The new Bantam, with lift capacity of six tons, can make outside turn in 19½ ft for maneuverability in tight quarters. Built primarily for materials handling, it has a 112-in. wheel base, over-all length of 173¼ in., and width of 96 in.—**Schield Bantam Co., Waverly, Iowa.**

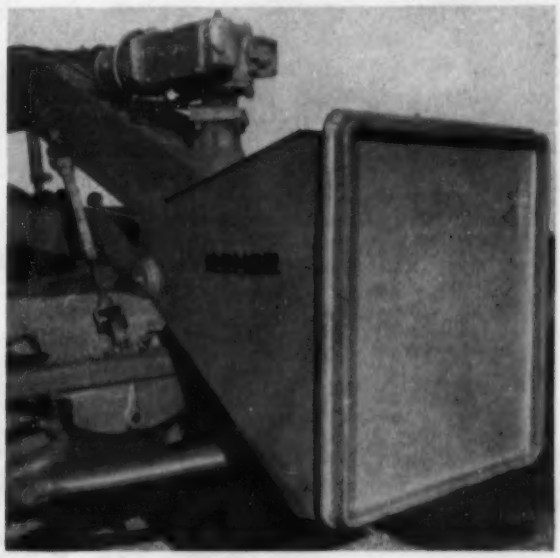
For Wet Rubbing Concrete

New angle head offers greater maneuverability for wet rubbing concrete. Operator pushes handy button to apply water through center of grinding wheel.—**Stow Mfg. Co, Binghamton, N. Y.**

On-the-Job Previews of Machinery, Tools and Equipment

Heavy-Duty Pulverizer

With 30% more power, the P-600 preparizer features reversed rotor operation enabling it to pulverize much tougher materials than heretofore possible. Dual drive to both ends of the rotor shaft provides positive power transmission.—**Pettibone Wood Mfg. Co., Box 620, 6900 Tujunga Ave., N. Hollywood, Calif.**

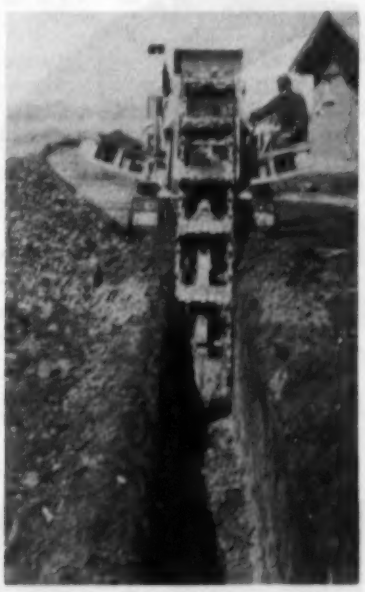


Motor Grader Push Plate

Mounted on the head casting of the No. 12 or 112 Caterpillar motor graders, the P-12 push plate allows the machines to be used for push-loading scrapers and for emergency pushing. A welded steel rim keeps push blocks centered on the plate.—**Ulrich Products Corp., Roanoke, Ill.**

Small Versatile Asphalt Plant

The 840-B asphalt plant may be used for a variety of installations in the 20-50 ton-per-hr range. Alone, the basic mixer can be used to produce stabilized mixes. With the addition of a hopper-feeder, the plant will produce accurately proportioned cold mixes, etc. The further addition of a portable dryer allows the production of hot mixes. —**Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill.**



Ladder-Type Trencher

A ladder-type Trench-liner, with minimum over-all dimensions and reduced weight does not sacrifice heavy-duty performance or digging capacity. The new Model 155

(Continued on page 169)

Drivers last longer...

when heavy-duty trucks use J-M Brake Blocks

Experienced operators know that when their vehicles are equipped with Johns-Manville Brake Blocks they can handle crushing loads without personal danger.

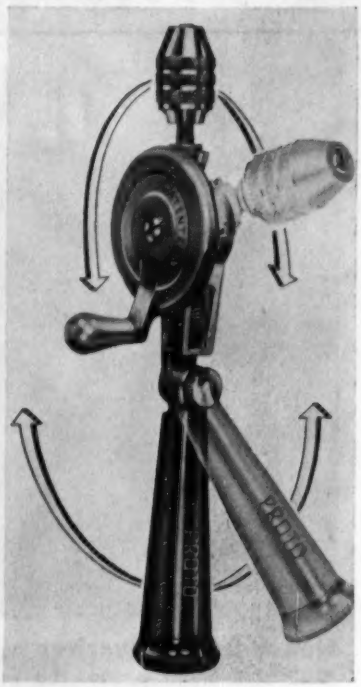
That's because these rugged, durable J-M Brake Blocks are engineered for the job . . . and designed for dependable performance plus maximum service life on trucks, shovels and heavy machinery.

They are "standard parts" on many famous makes of heavy-duty units. For fast, easy replacement, they are now available in Johns-Manville Assembled Sets that put new safety into your equipment.

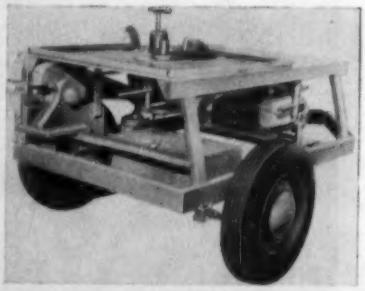
See your Johns-Manville Distributor for data on J-M Brake Linings and Clutch Facings for industrial equipment, or write Johns-Manville, Box 60, New York 16, N. Y.

Johns-Manville Industrial Friction Sets are available in a wide range of molded or woven, rigid or flexible asbestos materials.

Johns-Manville
INDUSTRIAL FRICTION MATERIALS

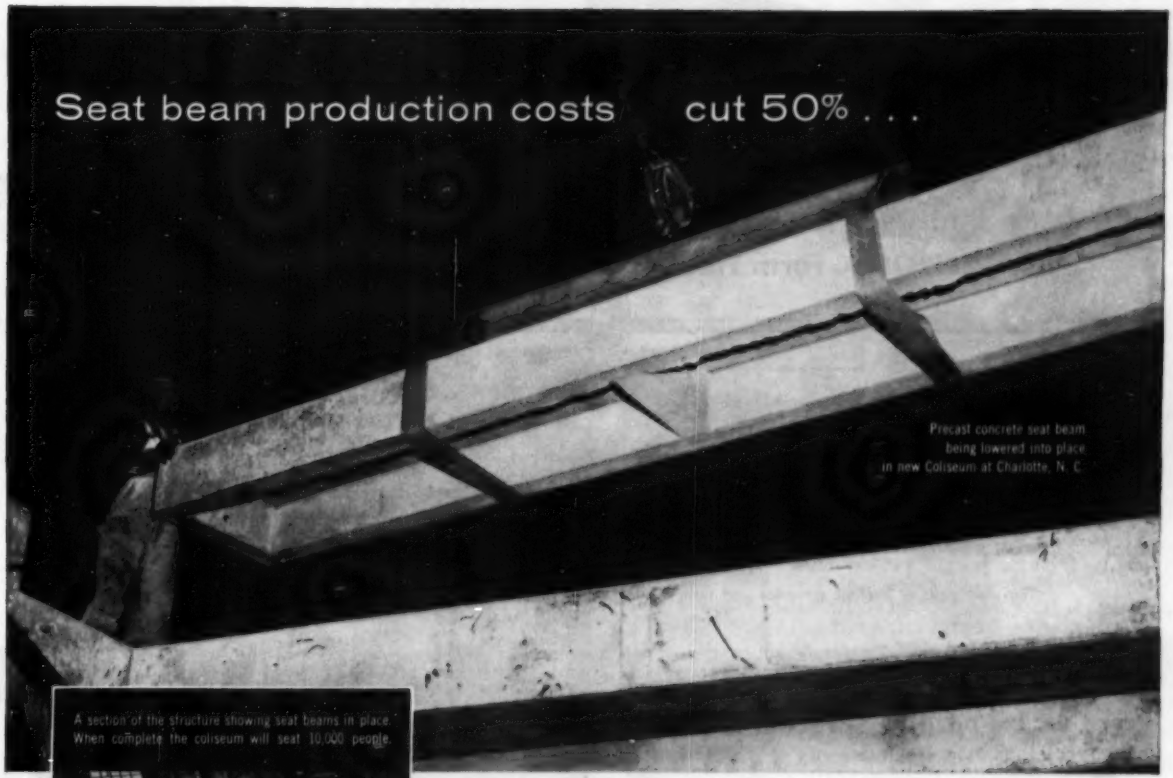


ALL-ANGLE DRILL — The Proto drill, No. 370, will reach around obstructions, work close to floors and walls and operate in close quarters, because both chuck and handle are adjustable to various angles. The 0 to ¼-in. capacity chuck swings through a 270-deg arc and is held in position by a spring lock. The handle turns in a 180-deg arc at right angles to the chuck movement path. It is held in its several positions by an adjusting screw. Storage space is provided in the hollow handle for a large number of regular and high-speed drills.—**Plomb Tool Co., Los Angeles, Calif.**



BENDER AND SHEAR—The Ironmaster portable hydraulic rod bender and shear can be easily towed from job to job behind a car or truck and can be moved on the job by one man. The unit is powered by an 8-hp gasoline engine. In addition to bending rods, bars and flats, pipe-bending dies are available for use with up to 1½-in. pipe.—**Midland Products Co., Midland Park, N. J.**

Seat beam production costs cut 50% . . .



Precast concrete seat beam being lowered into place in new Coliseum at Charlotte, N. C.

A section of the structure showing seat beams in place. When complete the coliseum will seat 10,000 people.

Architect: A. G. ODELL & ASSOCIATES, Charlotte, N. C.
Consulting Engineers: SEVERUD-ELSTAD-KRUEGER, New York City
General Contractor: THOMPSON & STREET CO., Charlotte, N. C.
Contractor for Precast seats: CONCRETE MATERIALS, INC., Charlotte, N. C.

with LEHIGH EARLY STRENGTH CEMENT

The unique design of the new coliseum and auditorium at Charlotte, N. C. called for 1000 precast concrete seat beams, each weighing 4000 pounds.

Using Lehigh Early Strength Cement and mass production methods to cast the beams, Concrete Materials, Inc. were able to strip and re-use forms within 24 hours. The beams were ready for placing in 72 hours, *less than half the time* that would have been required with regular concrete.

This fast production schedule, made possible by the use of Lehigh Early Strength Cement, cut labor, curing, form and general overhead costs by 50%.

Whatever your cement requirements, there are Lehigh Cements to fit them. And remember, somewhere on nearly every job, Lehigh Early Strength Cement will save time and money.

LEHIGH EARLY STRENGTH CEMENT
LEHIGH PORTLAND CEMENT
LEHIGH AIR-ENTRAINING CEMENTS
LEHIGH MORTAR CEMENT

LEHIGH

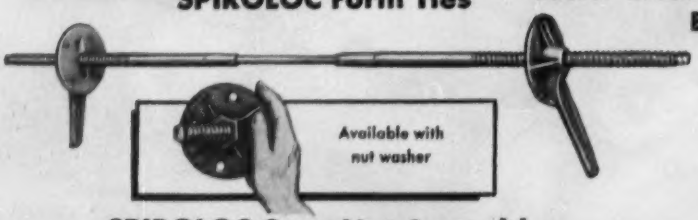
PORTLAND CEMENT CO. *Allentown, Pa.*

UNIVERSAL FORM TIES

a Complete Line From 1 Source

SPIROLOC Form Ties

Faster Erection . . . Positive Holding . . . Easier Stripping



- Greater tie strength for heavy construction
- Fewer ties per sq. ft. of form area. LOWER MATERIAL and LABOR COSTS
- Positive breakbacks
- Permanent, reuseable equipment
- RENTED . . . SOLD

SPIROLOC Cone Nut Assembly

The most positive internal spreader and form tie

TWISTYES | SNAP TIES

Positive Spreader Ties for all types of Concrete Construction

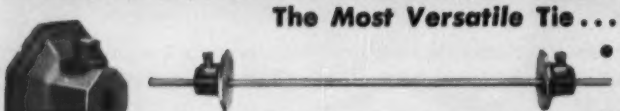
Combination wedge and bearing plate . . . easy application . . . won't twist or fall off —ample take-up.

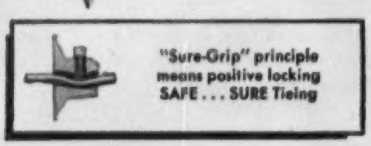
- Low cost ties for job-built or prefabricated forms
- Used with or without walers
- Accurate breakback . . . minimum plug required
- Choice of Spreader Washer . . . 7/8" flat is standard
- Rugged Twistye and Snap Tie Clamps have extra bearing surface . . . additional safety factor

Curved ends speed installation and stripping . . . long slope wedge for ample take-up. Extra nail holes permit nailing clamp in any position.

FORM CLAMPS

The *Most Versatile* Tie . . . At the Lowest Cost





- 2 Form clamps and a mild steel rod make a tie to handle any condition
- Wide clamp base gives more bearing on waler . . . won't "bite" at maximum loads
- Notched base permits nailing to waler

Write for Catalogs describing Universal Concrete Accessories and UNI-FORM Panels—There's no obligation

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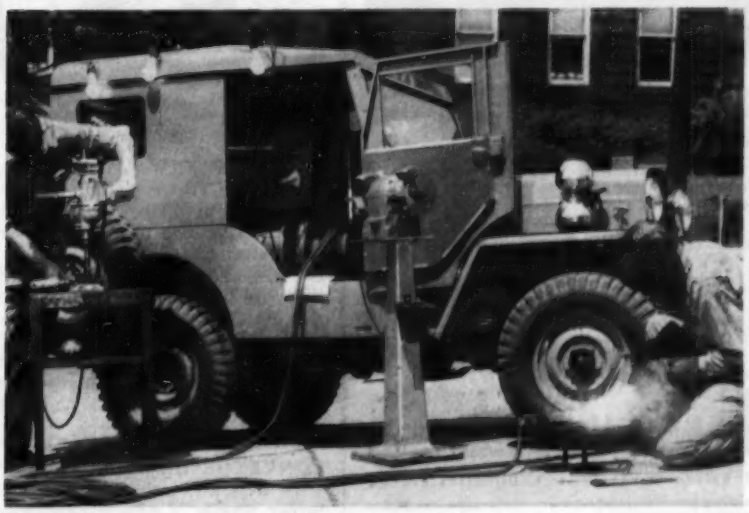
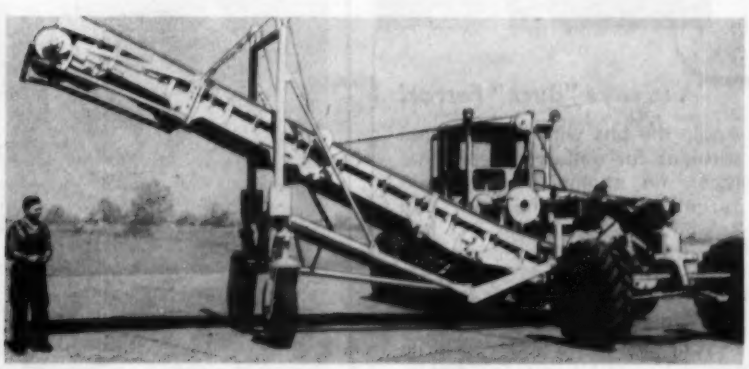
will dig 5.8 in. to 12.75 lin ft of trench per min in a range of 30 speed selections by lever control. A higher range of 30 speeds is available by a simple sprocket change, giving digging speeds up to 25 lin ft per min. The machine has a maximum depth capacity of 8 ft and widths from 16 through 26 in. Other features include hydraulic boom hoist incorporating positive down crowd; shiftable and reversible discharge belt conveyor; friction-type clutch for bucket-line drive that serves as an automatic safety to protect the machinery from shock loads; choice of 16-, 20- or 24-in. buckets to which oversize adapters can be fitted to increase width by 2 or 4 in., and a choice of 12-in. flat or 16-in. grouser-type tread on crawler mounting. — **Parsons Co., Newton, Iowa.**



VERSATILE JEEP—A Jeep-run, completely self-contained welder-power unit has been fitted out by A. J. Parsons, engineers and designers of special equipment for 4-wheel drive jeeps and trucks, to provide power at remote job sites. A 200-amp Lincoln generator and arc-welding control unit are operated from the power-take off unit of the Willys jeep. An oversize exciter furnishes auxiliary tools and lights with power. Room is provided for tools. The jeep with welding equipment sells for $2000. Front-mounted power winch and hoist can be added for another $500. — **A. S. Parsons, 80 W. Maiden St., Washington, Pa.**



ELEGRADER WITH OUTRIGGER—A 42-in. troughing belt Elegrader has been equipped with an outrigger to handle 27-ft conveyors. The unit, which fits both Adams and Caterpillar graders, consists of the standard 16-ft carrier and an 11-ft extension. Outrigger is attached only when conveyor length reaches 27 ft. Three bolts connect the tandem caster outrigger to the motor grader so that it adjusts for ground level variations. Because weight is distributed, manufacturers say the Elegrader can carry 600 yd an hr with a 14-ft clearance under the head pulley when the conveyor is at its 27-ft length. For moving, a drawbar connects from the grader to the conveyor and the wheels are turned and pinned. Shipping weight is 12,000 lb.—**Reisser Corp., Blair, Neb.**

LIGHTWEIGHT PUMP — Weighing only 26 lb, including motor and hinged carrying handle, this new pump is equipped with a vacuum switch that automatically stops the motor when the sump runs dry, permitting unattended operation. Capacity is up to 5 gpm with pressures up to 30 lb. Lifting water up to 10 ft unprimed and 22 ft primed, the pump has outside threaded ports for standard female garden-hose coupling. The motor is ¼-hp, 110-v capacitor type.—**Dept KP, Hypro Engineering, Inc., 700 39th Ave, N.E., Minneapolis 21, Minn.**

LIFT TRUCK — The Monomast, a new lift-truck design with only one mast, allows the operator a clear unobstructed view of both forks and load, permitting faster operation and reducing operator fatigue. The unique Monomast consists of two telescoping box-type sections. The weight of the new assembly is approximately equal to standard-type assemblies, but its tubular design is considered stronger than conventional models. The new unit allows a 15% increase in hoist speed. Raising speed is now 58 fpm. All standard hydraulic attachments can be attached to the machine. Non-hydraulic attachments are also available. The Monomast can be mounted on current 3,000- and 4,000-lb Hyster models UC-30 and YC-40 without alteration.—**Hyster Co., 2902 N. E. Clackamas, Portland 8, Ore.**

How to Get MORE Out of Your Dragline

A SAUERMAN Crescent Scraper may DOUBLE its Capacity

Any dragline can handle a Crescent Scraper of greater capacity than its regular bucket or clamshell.

The Crescent is much lighter, size for size. It hauls its load on the ground, being lifted only when empty. Larger machines can usually double their capacity with a scraper. Smaller units move about 50% more.

When the scraper is equipped with a carrier and is used with a track cable, machine range is limited only by the spooling capacity of the hoist drums. So equipped, it can reach farther, extend deeper under water or take material out of soft areas without the nuisance of mats.

Find out how much you can increase your dragline capacity. Tell us the make, model number and boom length on your machine. We will give you our recommendations.

Write for Catalog J, Crescent Scraper Buckets, and Field Report 228.

SAUERMAN BROS. INC. 612 S. 28th Ave. Bellwood, Ill.

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

"4-in. 'X' ROK-BITS drill over 3,000 feet"

. . . says "Buck" Ferrari

Again the bits with the job-fitted carbides far outlast conventional types, on another Pennsylvania Turnpike section. The 4-in. XKR Rok-Bits, on 2-in. round B&L hollow drill steel and adapters, regularly drilled over 3,000 feet for Latrobe Construction. Let us help you fit the correct carbide inserts to your job—speed your rock drilling—cut your bit cost. For details, write plant nearest you.

X-type Rok-Bits® used for drilling 3½-, 4-, 4½-in. holes, on 1½- and 2-in. drill rods on the new, larger machines. Request Bulletin B-1

Brunner & Lay Products

Brunner & Lay, Inc. 9380 King St. Franklin Park, Ill.

Brunner & Lay Rock Bit of Philadelphia, Inc. 2514 East Cumberland St. Philadelphia 25, Pa.

Brunner & Lay of Los Angeles, Inc. 2425 East 37th St. Los Angeles 58, Calif.

Brunner & Lay, Inc. 150 Leslie St., Dallas, Texas

Brunner & Lay Rock Bit of Asheville, Inc. Sweeten Creek Rd., Asheville, N.C.

Brunner & Lay Corp. 660 N. Tillamook St., Portland 12, Ore.

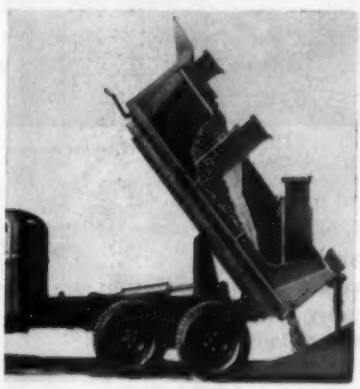
MASONRY SAW — Tak-A-Bout, is 40% lighter than regular saw models. Of tubular steel and aluminum construction, the unit has the structural strength of standard saws, yet is light enough to be moved about the job by one man. The unit is available in wet or dry cutting installations, and features a 110/220-v selector switch, allowing a selection of either working voltage.—**Champion Mfg. Co., 2028 Washington Ave., St. Louis, Mo.**

CONVEYOR BELTING—Reinforced with a new synthetic fabric called Super Ranile, a new conveyor belting material is 400% stronger than conventional cotton reinforced belts. It is now being manufactured in widths up to 72 in. and thicknesses ranging up to 15 plies. It is less expensive than steel-reinforced belts and can be easily spliced in the field. — **Hewitt - Robins Inc., Stamford, Conn.**

WARNING TORCH—Flame-Guard, a self-righting torch, features a square-type burner with umbrella style hood that stays lit under the most adverse weather conditions. Using kerosene or light fuel oil, the torch has a burning time of 24 to 48 hr, depending on weather conditions.—**Anthes Force Oiler Co., Fort Madison, Iowa.**

HEATING KETTLE—A new asphalt and tar kettle, Model F-7, has 325-gal capacity, two white kerosene burners, and a 20-gal fuel tank. Propane burners are optional. The unit is regularly furnished with fireproof top (especially valuable when used to heat cut-back and other highly inflammable materials). Optional are hinged top and warming hood, spray pump, spray bar and agitators. Weight, 2,175 lb. Mounted on four 6.50x16 tired wheels. Fenders are asbestos insulated.—**White Mfg. Co., Elkhart, Ind.**

CONCRETE GUN—A new portable rig for concrete and masonry restoration, waterproofing, acid-proofing, stuccoing, insulating, fireproofing, sandblasting and the application of refractories proportions, mixes and guns concrete and other cementitious materials. This equipment is available in five models with capacities from ¾ to 6 yd per hr.—**Air Placement Equipment Co., 1011 W. 24th St., Kansas City, Mo.**



CEMENT BOX—This all-steel box, attached to the partition gates on batch trucks, mixes cement with aggregate upon dumping. The boxes weigh 250 lb. Each has a 15-cu ft capacity. They are 71 in. wide, 34½ in. high and 14¾ in. deep. The aggregate is loaded in the truck, first pressing the door of the box shut. During unloading, the aggregate flows out, releasing the pressure on the box door. After about 4 or 5 cu ft of aggregate has been unloaded the cement starts to flow, mixing with the aggregate. The box is easily removable for normal dumping and hauling jobs.—**Dravo-Doyle Co., Fifth & Liberty Ave., Pittsburgh 22, Pa.**

Moments like THIS
can help reduce insurance costs
on jobs like THIS

View of construction of eight of the piers that will support the New York Thruway Bridge nearing completion across the Hudson River between South Nyack, New York and Tarrytown. Merritt-Chapman & Scott Corporation, Contractor, use AJAX Cups and drinking water equipment on this job.

Several times a day – at moments when he is relaxed, receptive, ready to read—crisp, clean AJAX Cups put their imprinted safety messages right in this worker's hands.

And safety messages *that get read*, says the National Safety Council, definitely help reduce accidents. Fewer accidents mean lower insurance costs . . . can even spell the difference between profit and loss on a job. Why not put AJAX to work in *your* accident prevention program?

A TYPICAL EXAMPLE

(Actual case history from insurance company files)

One year Contractor B paid insurance premiums of $16,165. The next year his payments totalled only $14,286. Yet his base manual rate for the second year actually was nearly $2000 *higher* than the first. He saved that, and $1869 more, because an active accident prevention program earned him a substantial credit on his second year premium.

AJAX® CUPS and Drinking Water Tanks deliver fresh water to workers — mean less time lost on the job. AJAX Cups and new all-size Dispenser are also ideal for stationary tanks, barrels, pipeline faucets. 4 oz., 6 oz., and 7 oz. sizes packed imprinted with assorted stock safety messages — or your own message to order.

GET THE FULL STORY—Write us today for this new folder which gives full details on imprinted AJAX Cups and equipment.

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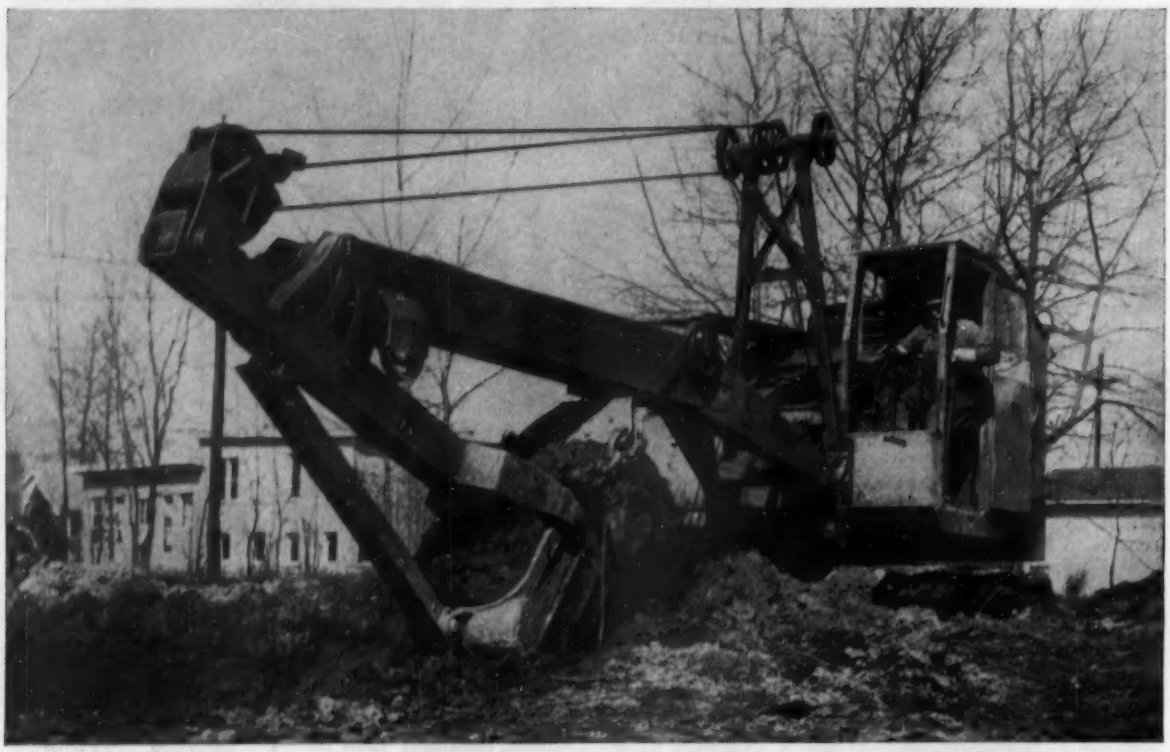
Where parts must be

EXTRA TOUGH

specify AMSCO® MANGANESE STEEL



Amsco backhoe bucket at work

Digging! Crushing! Handling! Amsco manganese steel parts work up to 10 times longer under punishment . . . because manganese steel can easily absorb heavy impact and abrasion. Hard work toughens the metal . . . it work hardens to as high as 550 Brinell. The pounding, grating action of rock and ore only polishes manganese steel.

To get maximum life out of your equipment, specify Amsco manganese steel parts from the manufacturer.

DIGGING

backhoe buckets
dippers and parts
repointers
dragline buckets and parts
dragline chain
sheaves
pinions
crawler shoes

CRUSHING

concaves
mantles
jaw plates
mill liners
hammers

HANDLING

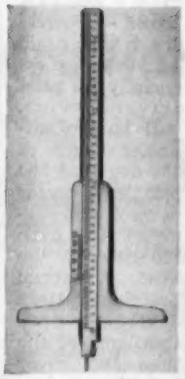
bulldozer blades
tractor rollers, idlers
sprockets, grouser bars
truck beds
grizzle parts
ore car wheels and liners
sheaves, gears, pinions

Amsco also produces other alloy steels with maximum wear resistance under particular conditions of service.

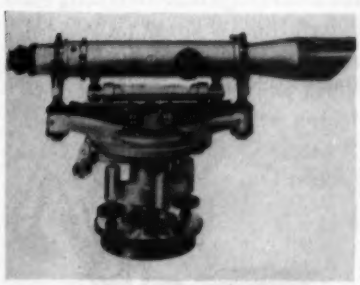
AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

VERNIER DEPTH GAGE—Equipped with a 1/1000-in. vernier, this gage provides a fast and direct reading depth gage by scale and vernier. The new Mauser depth gage will measure the depth of extremely small holes. The tool is available in two sizes of 3- and 5-in. measuring capacity.—**George Sherr Co., Inc., 200 Lafayette St., New York 12, N. Y.**



HYDRAULIC LOAD CONTROL—A unique hydraulic instrument for precision control in load hoisting or lowering operations, called Hydra-Set, applies as a link between the hoisting mechanism and the load. It will raise or lower loads with accuracy to close tolerances, independent of crane or hoist control system. Requiring no special installation, the unit eliminates jockeying and puts control in the hands of the operator at the point of visual contact. Two or more units may be used to level up loads. The instrument also serves as a crane scale, weighing the load as soon as suspended. Standard models have 20-ton capacity and 12-in. stroke. Greater capacities and strokes are available. — **MEFCO Sales & Service Corp., 1509 Gardena Ave., Glendale 4, Calif.**



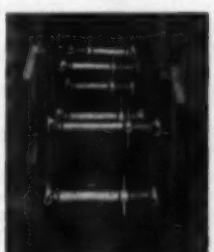
CONVERTIBLE LEVEL—The Model 40 convertible level features a new cast brass internal focusing telescope completely sealed against dust and dirt and 24-power coated optics with cross-wires on a glass reticule. A circular level mounted on the top plate cover enables a quick approximation of the instrument set-up. A nylon pinion bearing, a steel center, and a level bar cast in one piece with the circle cover—all tend to reduce instrument maintenance. A new eye-piece cap with resetting scale is an improvement in that it enables the user quickly to reset the telescope to the individual eye.—**Warren Knight Co., 136 N. 12th St., Dept T, Philadelphia 7, Pa.**

Doing It the Easy Way with SIMPLEX JACKS...

PRESTRESSING CONCRETE SLAB with a Simplex Re-Mo-Trol 30-ton hydraulic puller. When cured, 26' x 38' slab will be raised to form third story floor of school building. Intervening floors will then be cast, prestressed and raised into position. Only Re-Mo-Trol gives straight-line pull to prestressing wires through unique "center-hole", eliminates need for complicated back-up devices. Also has many uses as a powerful lifting jack on construction jobs.

15-TONS OF LIFT on either the cap or toe of this Simplex Model 24A jack is a feature that construction men like. Full capacity toe lets them lift from minimum clearances, cuts wedging and blocking necessary. Jack is ratchet lowering lever type; raises or lowers notch-by-notch —can't be tripped. 13" of lift.

TIMBER "STRETCHER" speeds shoring on foundation and tunneling work. Simplex Shoring Jacks, available in 25-ton or 35-ton sizes, are faster and safer than old-fashioned saw and wedge methods.



WHEN YOU'RE DOWN A HOLE you can feel safe with these Simplex Trench Braces on the job. Made entirely of drop forged steel. Easy to adjust, grip at any angle, can be nailed to timber for slip-proof safety. For any width trench.

WORLD'S LARGEST MFRS. OF INDUSTRIAL MECHANICAL AND HYDRAULIC JACKS
SIMPLEX JACKS

SIMPLEX CONSTRUCTION JACKS are fully described in General Catalog 53. Write for a free copy.

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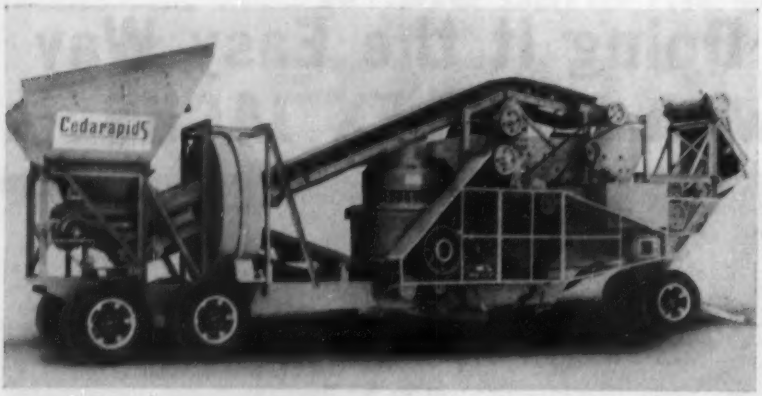
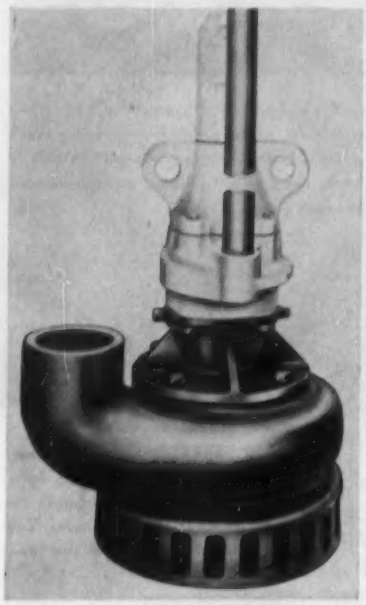
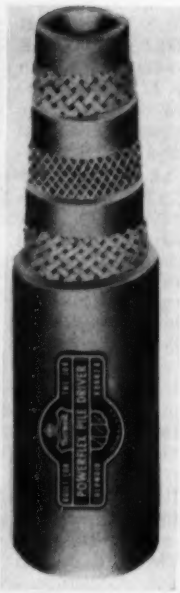


PORTABLE CRUSHING PLANT—Cedarapids Model 30-C portable secondary crushing and screening plant handles all its crushing with a 30-in. Symons Cone Crusher. Specially designed for use in quarries or gravel pits where the material is exceptionally hard, it has five different screen deck arrangements available with a sand screw discharging on to a side delivery conveyor. The screens can be equipped with spray bars for producing washed aggregate.—**Iowa Mfg. Co., Cedar Rapids, Iowa.**



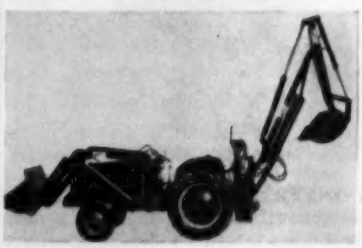
PNEUMATIC SPONGE PUMP—The BJ 2½-in. L pump is a vertical, single-stage, centrifugal pump driven by a rotary air motor operating on compressed air at pressures from 60 to 100 psi. Air consumption is 57 to 99 cu ft, and capacities are up to 380 gpm. Equipped with a governor and variable speed control, permitting regulation to suit particular conditions of the job, the unit has an oiler with capacity for 10 hr's operation. Impeller is two-part non-clog type. The pump is ready to go to work simply by connecting it to a 105- or 125-cfm air compressor. No priming is needed. An exhaust pipe prevents muck and water from entering the motor. The length of the exhaust can be extended, as required. — **Byron Jackson Co., Pump Division, P. O. Box 2017, Terminal Annex, Los Angeles 54, Calif.**

OPTICAL PLUMMET TRANSIT—The new 57-FHR-20 Transit provides advantages to be gained from optical reading theodilites with many of the points of superiority of a standard transit. The major innovation featured by this transit is a telescope through the optical center of the transit, pointing vertically when the transit is level. To permit ease of observation, the plummet telescope is turned at right angles by means of a prism, so that the observer actually looks through the telescope horizontally in setting up over a point. A plumb-bob plug can be pushed into the tripod for rough centering to within a few inches of the station point. The transit weighs 15 lb and is furnished with an extra rigid tripod with fixed legs 54 in. long.—**W. & L. E. Gurley, Engineering Instrument Division, Troy, N.Y.**



PILE - DRIVER HOSE — Powerflex, a wire-braid hose designed especially for pile-driver service, will handle saturated steam at 385 deg F at 200 psi. Two braids of steel wire prevent sudden bursting of the hose. A special braiding pattern develops a positive bond of the tube and cover to the wire braid reinforcement. One ply of insulation is fixed between the braids. The bond between coupling and the outside wire braid provides a static ground and permits use of this hose in areas where flammable liquids are present. The hose is available in four sizes —1½, 2, 2½, and 3 in. ID., in 50-ft lengths weighing 100.5 lb for the 1½-in. size to 197 lb for the 3-in. size —**Thermoid Co., Trenton, N. J.**

SURVEYORS TARGET—Made for the engineers 6-ft folding rule, Rule-Site fulfills an urgent need for improved sights on the folding rule. Rule-Site provides 7 sq in. of sighting surface, and graduations 8 times larger than those on the folding rule, visible on sights of 1,000 ft and more. It slides readily over all folding rules and is easily screw-locked in place at any point, even at the joints and zero point.—**Rule-Site Co., Box 93, Baldwin, N. Y.**



BACKHOE AND SHOVEL—A pair of new working attachments for the International 300 tractor, the C-10 hydraulic backhoe and the TS-7, tractor shovel are now available. The backhoe is available with a telescoping boom digging 10 ft 6 in. or a standard boom digging 8 ft. Both booms provide a loading height of 8 ft. The unit has 160-deg working radius. The model TS-7 tractor shovel can be equipped with bucket, hoisting crane, dozer blade or fork lift. —**Henry Mfg. Co., 1700 N. Clay St., Topeka, Kan.**

Carnaghi digs into lubrication problem...comes up with answer

Ray J. Carnaghi (right) discusses lubrication of equipment with Frank Wolan, Standard Oil automotive engineer. Frank has been serving customers for Standard Oil since completing the Standard Automotive Sales Engineering School. He got his engineering training at Michigan State College. Customers have found Frank's experience and training pay off *for them.*

STANOLUBE HD-M
MOTOR OIL

Like every outfit in the business of moving earth, Joseph P. Carnaghi & Sons, Detroit, know what it means to keep equipment on the move. There is no place on the schedule for stuck rings, bearing failures, fouled plugs. Down time due to lubrication failure is something Carnaghi learned how to eliminate 20 years ago. It was then that this contractor began using Standard Oil products.

Now STANOLUBE HD-M Motor Oil is used in Carnaghi trucks, cranes, shovels and dozers. Earth haulers that go away heavy and come back light, give oil a full challenge to deliver trouble-free operation. Wet, dry, heat, cold, and grit are the order of business for dozers, shovels, and cranes. They give motor oil tough, rugged jobs to do.

STANOLUBE HD-M stands up to the jobs Carnaghi gives it with a wide margin to spare. It is designed to do just that. Carnaghi equipment maintenance men have found this out from inspection of equipment at overhaul time. Their skilled maintenance, teamed with STANOLUBE HD-M, result in:

1. Pistons free of varnish
2. Less cylinder and ring wear in high temperature service
3. Valve stem deposits and valve burning virtually eliminated.
4. Engines unaffected by unstable fuels
5. Less spark plug fouling
6. In low temperature service, less sludge

This sound like the kind of operation you would like for your equipment? A Standard Oil automotive engineer will be happy to tell you how, with STANOLUBE HD-M, you can get it. In the midwest, a call to your nearby Standard Oil office will bring prompt response. Or contact Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

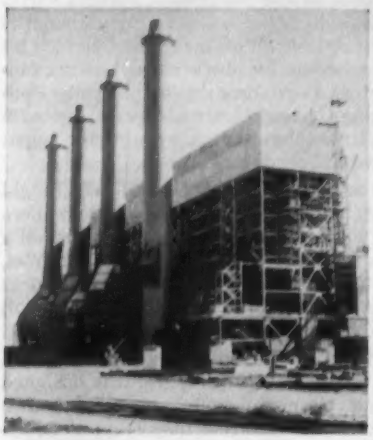
STANDARD

STANDARD OIL COMPANY (Indiana)

Contractor Joseph P. Carnaghi & Sons dig foundation for new building. STANOLUBE HD-M Motor Oil is used in all Carnaghi equipment.

LAYKOLD WEATHERCOAT

protects insulation on $75,000,000 steam plant



FOUR-INCH magnesia block insulation was specified for exposed boiler areas, ducts, and breechings on the recently completed 600,000 kilowatt steam plant of Pacific Gas and Electric Company at Pittsburg, California. Laykold Weathercoat was used as the protective coating for this insulation.

Replaces canvas cover—Original specifications called for a canvas covering applied with adhesive over the magnesia blocks, but Laykold Weathercoat was used when failure of the canvas covering was experienced at another plant. Laykold Weathercoat provides a *tough, resilient* coating that withstands both vibration and weathering.

Applied cold by industrial-type spray equipment (or trowel), Weathercoat gives lasting protection.

Write for full details.

AMERICAN Bitumuls & Asphalt COMPANY

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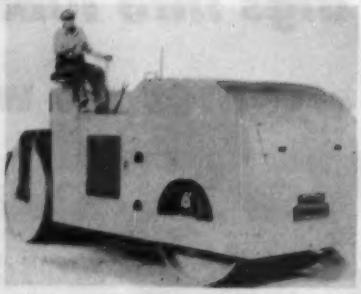
Mobile, Ala. Cincinnati 38, Ohio Columbus 15, Ohio
Tucson, Ariz. Seattle, Wash. Baton Rouge 2, La.
St. Louis 17, Mo. Inglewood, Calif. Oakland 1, Calif.
Portland 7, Ore. Washington 5, D. C. San Juan 23, P. R.



ROLLER — Three new two-axle tandem rollers called the KT-15A series are in the 5-8-, 6-9- and 8-10-ton class. The new machines feature a single-stage torque converter which automatically matches power and speed to variations in the material and grade. Bevel-gear final drive has the advantages of: unusually low gear teeth bearing pressures, easier adjustment, elimination of back lash and the use of fewer parts. Featured also is a yoke and kingpin assembly that utilizes adjustable tapered roller bearings for reduced wear and easier turning response. To assure maximum engine protection from harmful abrasives, the engines are fully enclosed for dust-free operation.—**Buffalo-Springfield Roller Co., Springfield, Ohio.**

IRON POWDER ELECTRODES — The new Sureweld iron powder electrodes 24 and 27, cost less to use and provide up to 25% faster welding than E-6012 and E-6020 electrodes of the next larger size, according to the manufacturer. Also, they are reputed to produce welds with higher impact values, greater crack resistance and deeper penetration.—**National Cylinder Gas Co., 840 N. Michigan Ave., Chicago 11.**

TRUCK MIXERS—Feature of these new Transcrete truck mixers is a chute arrangement which gives better flexibility on any kind of pour and makes chutes easier to handle and wash. Also featured is improved charging hopper control. A flip of a lever locks the hopper in for charging, out for discharge. Other features are Floating Drive with a chain take-up adjustment which eliminates the troubles experienced with ordinary rigid drives; larger drum diameter; L-section blades, and conveniently grouped rear-end controls for remote operation from either ground or catwalk. Available in 3½- to 6-cu-yd capacities.—**Construction Machinery Co., Waterloo, Iowa.**

"Superior" Electric

Carpullers

CAPSTAN TYPE, DRUM TYPE AND SPECIAL TYPES

Model SC Superior Capstan Carpuller

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One man can move hundreds of tons of rolling load with practically no effort. Economical, efficient, Carpullers are available for your specialized requirements.

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20 out of 22 crawlers drive through torque converters

. . . and they're all Twin Disc!

Of the 22 crawler tractors working on the first section of the Indiana Toll Road now under construction—*20 are equipped with Twin Disc Torque Converter Drive!*

Why this top-heavy proportion of Torque Converter crawlers? Let's ask H. T. Lattimore, general superintendent for Suber & Co., of Whitmire, S. C., the contractor with the earth-moving contract for the first 12-mile stretch.

"We prefer Torque Converter crawlers," says Mr. Lattimore, "because they give us more usable power, and more power *means more work done every day.* The Torque Converters cut out engine lugging, cut down on shifting and clutching and make it a lot easier for our operators to match tractor power to the load. Operators move more dirt and are less tired after a full day's work on a tractor with Torque Converter Drive."

Throughout the construction industry, more and more contractors are carefully checking the performance of Torque Converter-equipped tractors . . . and arriving at the same conclusions! That's why *all three* of the "Big 3"—Allis-Chalmers, Caterpillar and International, manufacturers of the most powerful crawler tractors now available—have standardized on Twin Disc for their Torque Converter Drive models!

Be sure there is a Torque Converter Drive in the next tractor you order. Check with your dealer today for complete information on Torque Converter Drive — and the tremendous increase in *drawbar pull* it will give your tractors.

Photo — Excavating on the Indiana Toll Road, Suber & Co. is working ten HD-20, six new HD-21, one HD-15AC Allis-Chalmers and three TD-24TC International crawlers—a total of 20 out of their 22 tractors on the job *driving through Twin Disc Torque Converters!*

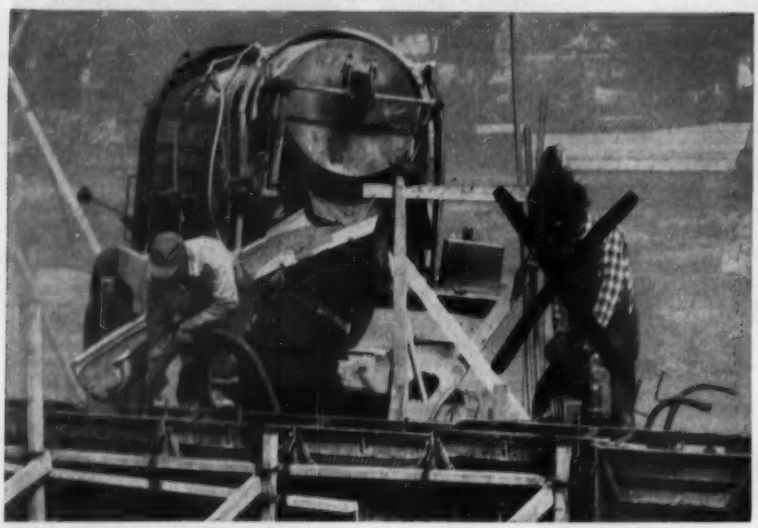
TWIN DISC

TWIN DISC
Torque Converters

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division) Rockford, Illinois

SAW-JOINTER—A new saw-jointer combination is specially designed for those who need the additional capacity of a 42.5-in. jointer bed. Combining a standard 10-in. tilting table circular saw and a long-bed, 6-in. jointer mounted on a single stand, it operates both machines off the same motor. Chief advantages cited are lower initial motor investment, space savings, lower power cost, and portability. The machine weighs 450 lb and is available for single- or three-phase operation.—**Delta Power Tool Div., Rockwell Mfg. Co., 442 N. Lexington Ave., Pittsburgh, Pa.**

(Advertisement)



NEW MASTER "1-MAN" VIBRATOR CUTS VIBRATING COSTS IN HALF

Only 25 lbs. Easy to handle.

It weighs 25 pounds! It's all in one piece! It plugs into any regular 115 Volt AC or DC electric line . . . and with no heavy engine or motor to drag around, one man handles it easily.

The motor is sealed in the vibrating head, so there's no flexible shaft to get out of whack; no oiling or greasing problems; no kinking troubles.

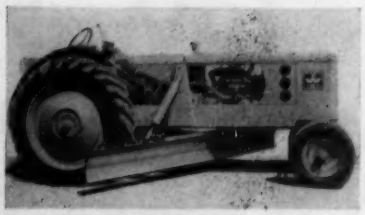
No field maintenance is necessary: when motor head needs attention, snap it off and snap on a spare.

The vibration actually penetrates farther and leaves fewer voids in the concrete than old-style vibrators.

The price is *low*. The design has eliminated so much cost, and no special power source is required, but the big saving comes in use. Write for folder or ask your Master distributor for a free demonstration. You'll see exactly how the Master "1-Man" can cut your vibrating costs *at least* 50%.

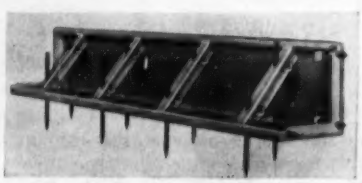
MASTER VIBRATOR COMPANY
605 Stanley Ave., Dayton 1, Ohio

MASTER



ROAD MAINTAINER—Featuring a torque converter and power-sliding moldboard, the new Maintainer is available with diesel or gasoline power. Also with a Continental F-162 gas engine with 45.5 hp or a GD-157 diesel engine with 40 hp. Five speeds range from 1.7 to 21 mph. The new Maintainer is both heavier and longer than the present model, weighs 7,200 lb. Its wheel base is 9 ft, 6 in. Other new features are higher front axle clearance for straddling larger windrows; one-piece, all-welded frame construction, and increased accessibility of all assemblies for easier maintenance. Standard equipment includes hydraulic brakes. — **Huber-Warco Co., Marion, Ohio.**

PLASTIC TRAFFIC LINE—A new plastic traffic marking compound, Veon, is said to outlast paint five-to-one and to be more economical than either paint or inlaid marking disks. A test report says further that the compound dries to the touch immediately after application, and a vehicle driven over the line within 15 sec after it was put down showed no evidence of pick-up on the tires or smearing of the line.—**Broadway Maintenance Co., 22-09 Bridge Plaza, N., Long Island City, N.Y.**



PAVING FORM—The new improved Heltzel Dual-Duty road and highway form enables the contractor to get two standard heights from a single form simply by turning it on its side. Built entirely of manganese steel for greater strength, the form combines added strength with setting ease. Heavy channel sections replace conventional stake pockets to give added strength to the tread section. Steel stakes formed of rerolled rail are furnished with the forms. Dowel lock ends form positive locks at all three corners. For use with conventional equipment, the forms will be supplied with standard slide lock where specified. Form face made in any height combination to customer specification. — **Heltzel Steel Form and Iron Co., Warren, Ohio.**

Yes, MM Engines are built and equipped to order

FURNISHED TO YOUR SPECIFICATIONS IN LOTS OF 1 OR 100!

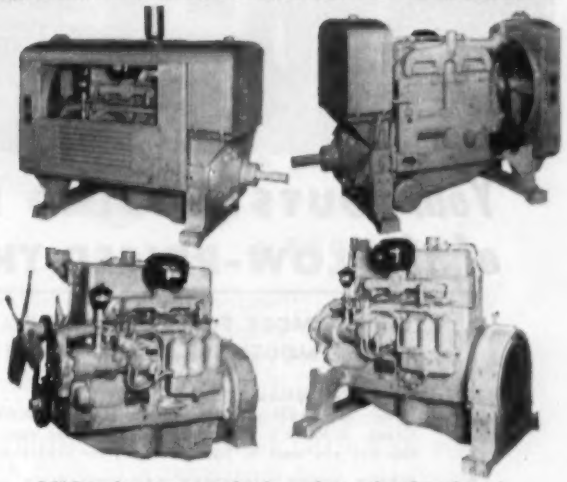
You get power adaption that fits your specifications more readily with Minneapolis-Moline engines. Why MM? Because, as an independent engine builder, no single sales outlet dictates MM engine design—and MM works in such a big variety of power applications.

To meet a wide range of basic requirements MM engines have large displacement for high torque at moderate rpm. Extra high compression and high turbulence combustion combined with high volumetric efficiency provide outstanding performance.

For these reasons MM units are ready to go when equipped with specified operating accessories. You eliminate major auxiliary unit purchases to adapt engine characteristics to meet momentary high load demands. Further long run benefits are low fuel consumption and low maintenance that total up to low cost production.

Every-day experience in supplying a wide range of unit requirements enables MM to maintain customary high quality in single or small lot quantities at reasonable cost.

A high degree of standardization results in high production parts that provide precision fits and permit MM to schedule parts for special units in large quantity, assuring early delivery and customer service.



MM engines are completely engineered and equipped for gasoline, LP gas, natural gas, or distillate fuels. Sizes range from 206 cu. in. portable units to 1600 cu. in. stationary engines and are available for fan to flywheel application or, completely enclosed leg mounted installations. MM also builds a line of industrial Diesel power units: Sizes—283-, 425-, 605 cu. in.

Standard equipment includes vacuum crankcase ventilation, thermostat controlled bypass cooling, packaged water pump, built in variable speed governors, enclosed gear driven oil pump, and oversize full-flow oil filters (shunt-type filters are provided exclusive on MM Thermo-Clad units).

Send details on your application for examples of MM built-to-order packages for original or replacement needs. Engineering service available for pumps, hoists, crushers, generators, shovels, ditchers, cranes, compressors, feed mills, saw mills, planing mills and similar installations. When you want dependable performance year after year from your engine, you want an MM Industrial Power Unit.

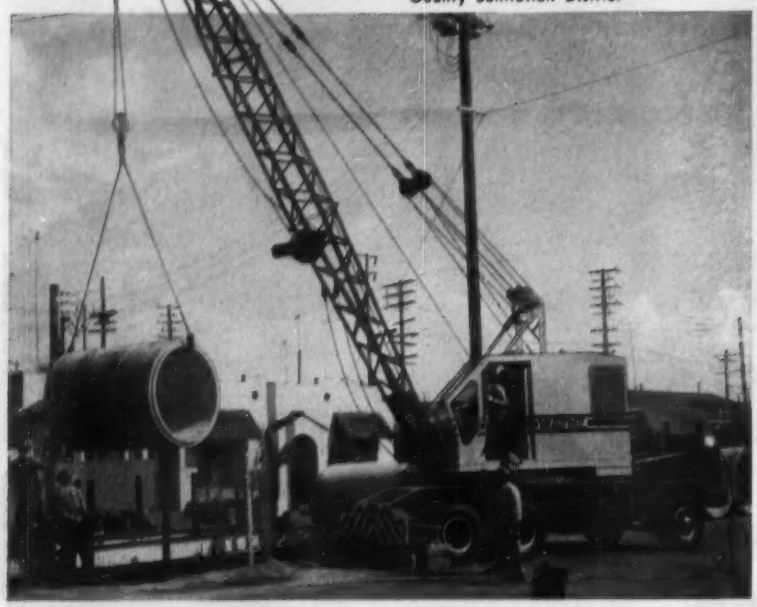
INDUSTRIAL DIVISION

MINNEAPOLIS-MOLINE MINNEAPOLIS 1, MINNESOTA

WAYNE

MODEL 50B

FULL ¾-YARD, 25-TON TRUCK CRANE
owned by the Los Angeles
County Sanitation District



Your OUTSTANDING BUY *of the* LOW-PRICED THREE

You get MORE FOR YOUR MONEY with THE WAYNE MODEL 50B TRUCK CRANE . . . Here's why

IMPROVED QUALITY AT LOWEST COST . . . it's easy to lower your initial investment cost when you buy the WAYNE Model 50B Truck Crane. WAYNE'S advanced design enables you to equip the 50B just the way you want it. You never pay for expensive, unneeded accessories.

MEETS MORE HIGHWAY REQUIREMENTS than any other ¾-yard truck crane. This exclusive WAYNE feature gives you maximum mobility and roadability, and cuts operating costs, too. You move rapidly from job to job.

THE CUSTOM-MADE CARRIER is built for this particular machine to give owners the full advantage of all WAYNE Model 50B features. This integration of carrier and upper works is important. It means greater efficiency.

FULL ¾-YARD, 25-TON CAPACITY . . . The WAYNE Model 50B is not a "beefed up" smaller machine.

OPTIONAL FEATURES CAN BE ADDED ANY TIME . . . Power load lowering, double-load rollers, independent boom hoist and other WAYNE-engineered accessories are available for greater performance. They can be added to the Model 50B even while it's in the field.

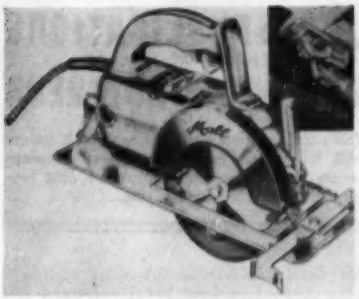
WAYNE'S 50 YEARS OF EXPERIENCE in the design and manufacture of earth-moving and materials-handling equipment are your guarantee of improved quality at lowest cost.

. . . DOLLAR FOR DOLLAR and FEATURE FOR FEATURE . . . WAYNE IS YOUR BEST BUY

WAYNE SHOVEL and CRANE DIVISION
AMERICAN STEEL DREDGE CO. INC., FORT WAYNE, INDIANA

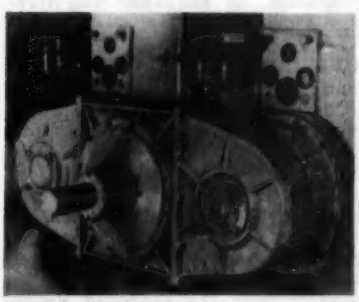
FORK-TRUCK—A new model Reach fork truck which can handle 3,000-lb loads has been designed with heavier carriage and uprights, larger rams and a revised power unit. The new truck telescoping upright members are of formed steel. The elevation sections ride on guide rollers having large oversize bearings, and bigger bearings are also used on the carriage rolls. It will operate in 6-ft aisles and handle pallets or skids of varying sizes. In operation, the Reach fork truck moves up to the edge of a palletized load. The forks are then extended out to enter the pallet, raised slightly to lift the load and retracted for transporting the pallet. It works well in bulk storage, rack areas, freight cars and trailers. **—The Raymond Corp., 135-132 Madison St., Greene, N.Y.**

CUTTING MACHINE—Speed-Cut, a new abrasive cutting machine, is made for metal-working plants or contractors for cutting all shapes and types of materials. The manufacturer states that one man with the use of the new machine can do all the cutting necessary for an installation crew of 40 to 80 men. Variance of shape or material is no hindrance. Thin-walled steel aircraft tubing, soil pipe, galvanized steel, angles, structural members or solid bars are cut with efficient speed. For example in field demonstrations, a 2-in. steel pipe was cut in 5 sec, a 4-in. cast-iron soil pipe was severed in 6 sec, a 4x4x⅜-in. steel angle took but 12 sec to cut. Classed as No. 14 and 20, by their wheel sizes, a No. 20 can sever a 6-in. soil pipe or a 2½-in. solid bar. A No. 14 can cut a 4-in. pipe or a 2-in. rod or bar. The No. 20 has a foot-controlled chain vise. The No. 14 has a hand-operated chain vise. A welded steel wheel guard shields the wheel at all times. **—Beaver Pipe Tools, Inc., Warren, Ohio.**



PORTABLE ELECTRIC SAW — Model 54, a recently released hand saw, features a narrow design that permits straight cutting in tight places, a handle centered over the motor for better balance, light weight, high speed (6,800 rpm), and an oversize shoe tightening in front and back for greater saw stability. The saw has a maximum cut of 1.85 in. at 90 deg. Weight, 8.75 lb.—**Mall Tool Co., 7725 S. Chicago Ave, Chicago 19.**

VINYL PAINT—A vinyl plastic base paint that can be thinned with water, yet is highly resistant to water and weather has just been released. Especially recommended by the manufacturer for use on green plaster, asbestos shingles and black asphalt, the paint can be used on masonry, brick, concrete and other hard to paint surfaces. No primer coat is necessary—the paint being self-priming and self-sealing. Vinyl resists salt water, acid air and industrial fumes. Drying to the touch in 10 min, it will resist water 1 hr after application.—**Tamm Industries, Inc., 228 N. LaSalle St., Chicago 1, Ill.**



MULTI-USE POWER ACCUMULATOR UNITS—Standard flanges and two interchangeable basic units that may be arranged in an unlimited number of combinations are advantages of these Funk Combo-Power Units. Two, three or four small, popular make low-cost engines may be compounded with torque converters to provide the required power and torque. Other combinations of these basic Funk Units include power dividers and extreme side load power takeoffs. They are made by **Funk Aircraft Co., Coffeyville, Kan.**

Another Contractor Specifies *Portable Truck* THURMAN SCALES

A 20-ton Thurman Portable Truck Scale owned by C. W. Matthews Contracting Co., Marietta, Georgia.

- ACCURATE
- DEPENDABLE
- PORTABLE
- PROVEN

Day-after-day more contractors are selecting THURMAN Portable Truck Scales. Hundreds of contractors in all parts of the country like the truly portable features of this scale as well as the versatility. For instance, the C. W. Matthews Contracting Co., as illustrated above, has utilized their THURMAN Portable Truck Scale in a permanent type installation. Yet, at a future date, this scale may be easily moved to a different site.

Then too, contractors like the dependable service that they get from THURMAN Portable Truck Scales. Time-proven in all types of installations, Thurman Portable Truck Scales provide a new concept in portable weighing. For detailed information on these scales, as well as prices and delivery, write on your letterhead for Bulletin 601.

OTHER THURMAN SCALES

Batching Scales
Liquid Weighing Scales
Portable Truck Scales
Industrial Scales
Pitless Scales
Pit Scales
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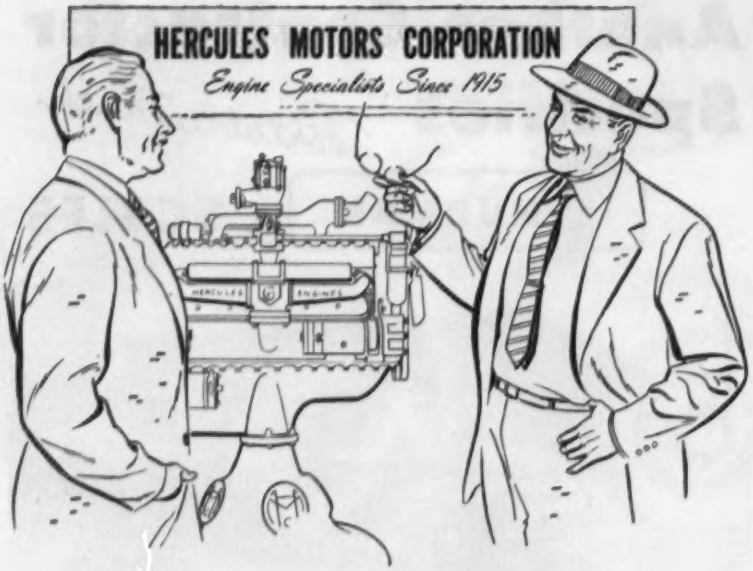
Wheelbarrow Scales
Electronic Scales

Precision Products Since 1918

THURMAN MACHINE COMPANY

Dept. B, 156 North 5th St., Columbus, Ohio



It May Cost a Little More to Buy the Best

But HERCULES ENGINES give you So Much More for your money.

● (1) Long-life service . . . not just an idle statement. Many HERCULES ENGINES 5, 10, and 15 years old are still delivering dependable day-in, day-out power. (2) Engines designed to-the-application . . . granted, we have over 90 standard models but they are not off-the-shelf items. HERCULES ENGINES are custom-produced to specifications of the equipment. (3) Gasoline or Diesel . . . many models of gasoline engines have similar mounting dimensions as diesel engines of like displacement. (4) Wide selection of fuels . . . HERCULES ENGINES operate efficiently on any popular fuel available, permitting the use of the most economical fuel in your area . . . gasoline, diesel fuel, natural gas, kerosene, L.P.G. and others. (5) Lightweight, heavy-duty construction . . . the excess metal that adds to engine weight has been eliminated . . . all 6 cyl. engines have 7 bearing Tocco hardened crankshafts, large precision-type bearings and full length water jackets are some of the extras which are standard on HERCULES ENGINES.

These are but a few of the features that make HERCULES ENGINES a better buy. For more complete information on the wide selection of Hercules Engines and Power Units, write for a copy of the folder, "Hercules Engines." This lists the many sizes of engines and their power ratings.

HERCULES ENGINES

HERCULES MOTORS CORPORATION

40 Years of Engines for Industry

111 Eleventh Street, S. E. • Canton, Ohio

New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

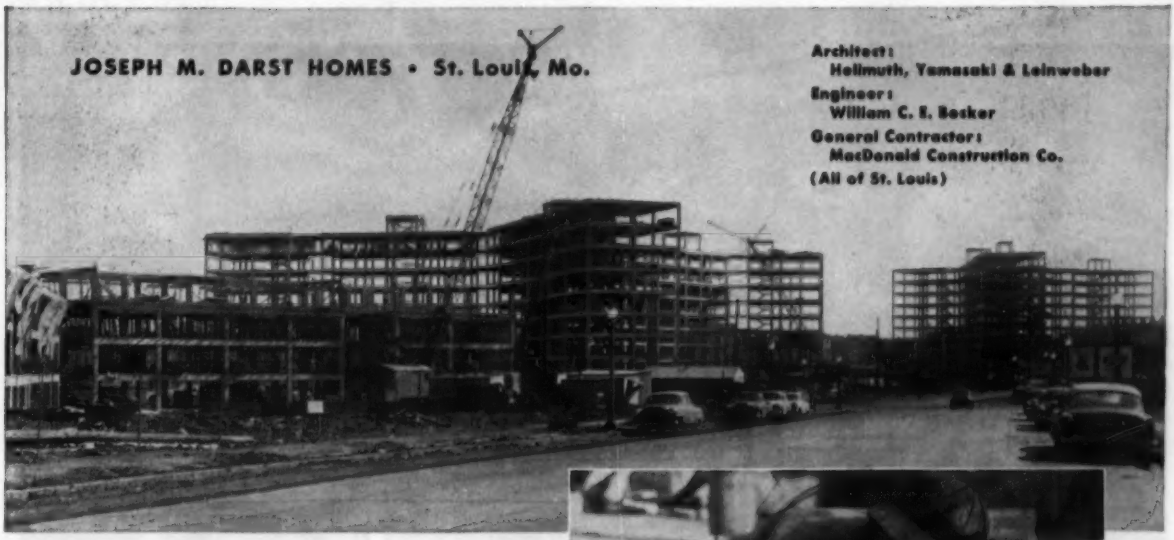
MOTOR GRADER—A new catalog (No. 380) has just been released on the 503 motor grader. The many attachments available for this machine make it virtually a self-contained road-maintenance department. A copy is available upon request from **Galion Iron Works & Mfg. Co., Galion, Ohio.**

BLOWERS—A new 6-p bulletin, No. 255, illustrates a newly developed series of tandem and motorized blowers. Including a number of simple graphs and tables, the folder makes it easy to determine the proper size unit for various applications. Obtainable on request from the **Miehle-Dexter Supercharger Div., Dexter Folder Co., Racine, Wis.**

POWER TOOLS—"How to Use Portable Power Tools" is the title of a new 200-p book by Maurice Reid, designed as an up-to-the-minute manual for the building and construction trades. It describes all types of standard portable electric tools, newly developed machines, and numerous attachments for specialized jobs. Instructive photographs, 180 in all, make this a practical basic guide for manual workers. Unabridged special editions available at $1.50 each by writing **Porter-Cable Co., 55 Exchange St., Syracuse 8, N. Y.**

OVERLOADER—A new 4-p brochure describing the Merton Overloader has just been issued. This machine features fast straight line loading and variable height discharge for economical handling of bulk materials. The brochure includes applications, suggestions, actual performance reports, optional equipment and complete specifications. Copies may be obtained upon inquiry from the **Seaboard Equipment Co., Inc., 7 Hanover St., New York 5, N.Y.**

AIR IMPACTOOLS—Form 5200-A contains the complete line of Air Impactools manufactured by Ingersoll-Rand. A 2-p spread is devoted to each size and contains illustrations, specifications and a list of the equipment furnished with each tool. On-the-job applications and case history studies are also included. Seventeen pages cover accessories and sockets used with Impactools.—**Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.**



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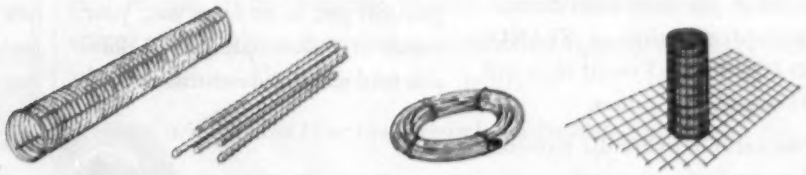
LACLEDE STEEL REINFORCEMENT

Laclede reinforcing steels—including multi-rib round reinforcing bars, spirals, tie wire, welded wire fabric and accessories—give vital strength and permanency to this new St. Louis housing project.

Scheduled for occupancy early in 1956, the Darst Homes will provide attractive and comfortable living quarters for 1,238 families.



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LACLEDE STEEL COMPANY

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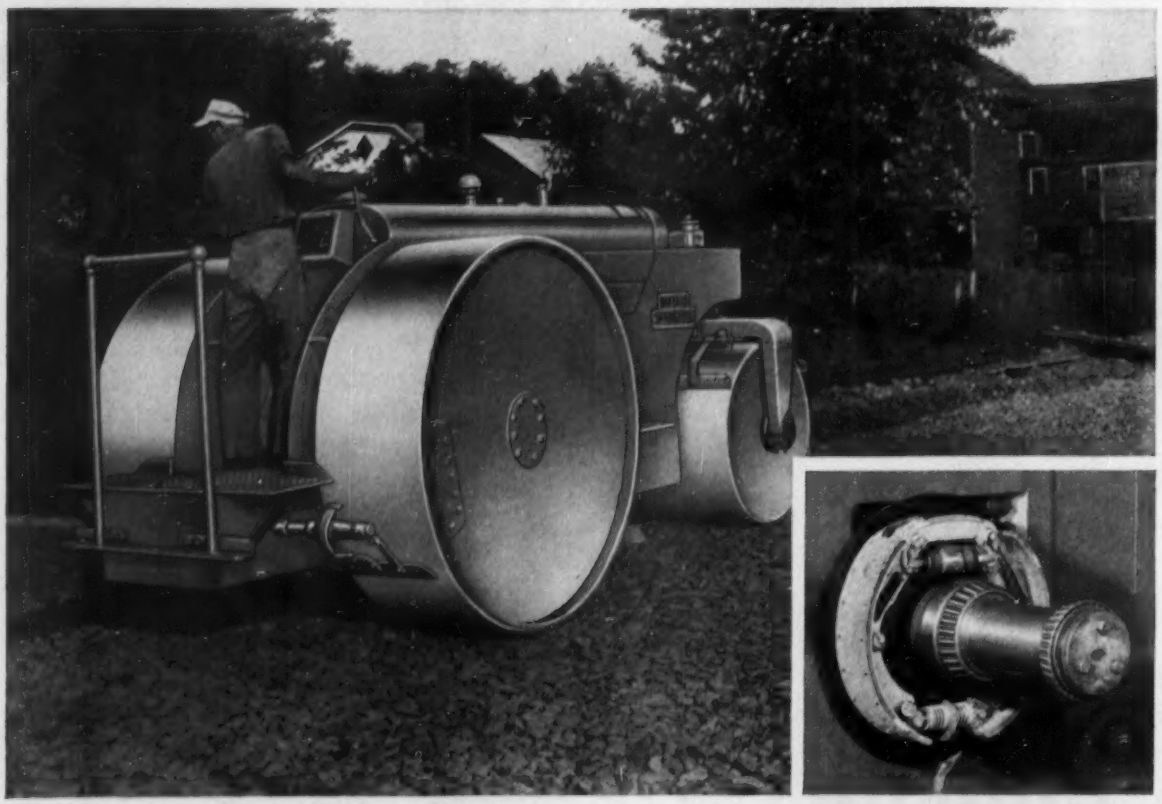

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. . . POWER ROLL BRAKES

plus TAPERED ROLLER BEARINGS ON ALL ROLLS

Here is another example of the kind of outstanding leadership in design and engineering that really means something to *you!* It is the type of advanced engineering that throughout the past has given you so many superior performance features . . . and now brings you these latest Buffalo-Springfield exclusives as STANDARD EQUIPMENT on all 10-14 and 12-15 ton 3-wheel rollers.

The vacuum hydraulic powered brakes on both drive rolls, and a mechanical parking brake mounted on the transmission, provide complete and positive braking control at all times and under all conditions. The tapered roller bearings on both the guide and drive rolls provide true rolling motion, easy adjustment and minimum maintenance.

In addition to these latest unmatched engineering advancements you still get, at no extra cost, your choice of Buffalo-Springfield's time-and-field-tested 4-speed transmission or torque converter drive; special torque-proportioning bevel gear differential; high-speed, low-torque clutches; improved hydraulic steering system for easier, smoother, more accurate, closer rolling.

Get the complete story on these new pace-setters today . . . preferred-performers tomorrow . . . from your nearest distributor.

BUFFALO ROLLER COMPANY — **SPRINGFIELD SPRINGFIELD, OHIO, U. S. A.**

THE LEADER IN COMPACTION EQUIPMENT DESIGN AND MANUFACTURE

GRADALL — An illustrated folder shows the railroad model Gradall mounted on a track-climbing truck, or on crawlers at work on a wide variety of railroad jobs. A number of special attachments such as formed buckets, a single tooth ripper, a gooseneck material-handling boom extension and a convenient grapple are shown in operation in the photographs. Folder may be obtained from the **Gradall Division, The Warner & Swasey Co., Cleveland 3, Ohio.**

FAIRLEADS FOR WINCHES—A recently released specification sheet on Carco fairleads for all models of Carco tractor winches published by the **Pacific Car & Foundry Co., Renton, Wash.**, contains illustrations of all fairlead models for use with model A, E, F and J Carco winches. Both three- and four-roller fairleads are included, with diagrammed description of operating parts and complete specifications. Swivel fairlead for Model A Carco winch is also included.

SILCONE POINT — A new, 6-p brochure on Sili-Kool, a revolutionary heat, rust and corrosion-resistant silicone paint for all red-hot surfaces that withstands 1,600 deg F and exposure to extreme weather conditions, may be had by writing **C. H. Dragert Co., Inc., 2518 Chalk Hill Road, P. O. Box 5092-L, Dallas, Tex.**

PANEL FORMS — How Uni-Form panels help reduce concrete forming costs on sewage treatment plant construction is illustrated in a 4-p folder available from **Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 51, Ill.**

CHAIN HOIST—A 12-p catalog (No. 158) has just been released on the CM Lodestar, an electric chain hoist. The bulletin presents a complete description of the unit which is available in capacities from ⅛ to 1 ton for operation on 115 v and 208-220/440 v power.—**Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.**

WHERE TO BUY

USE THIS HOSE ...for Your Toughest Drilling Jobs!

"HARDROK"
Wire Braid
AIR HOSE

Assurance of longer service life, with consequently lower replacement costs, recommends "HARDROK" wherever severest drilling conditions call for a truly super-strong air hose.

The carcass is made of horizontally braided steel wires, providing exceptional strength, durability and resistance to kinking, without impairing flexibility. The long-lasting Synplastic tube is impervious to the action of oil from the drill. The cover is a tough, wear-resistant yellow rubber compound. A black spiral stripe gives the hose a distinctive appearance for easy identification. Sizes ½" to 2", inclusive

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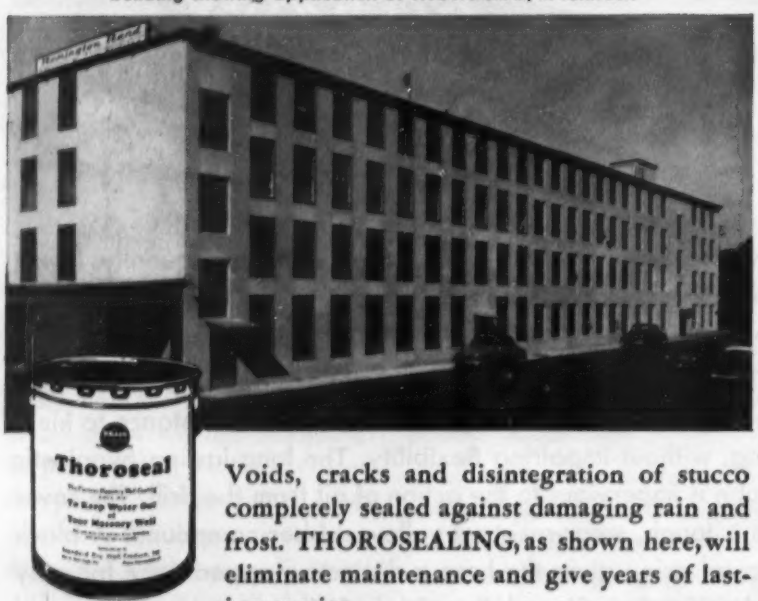
THOROSEALING
MEANS
WATERPROOFED

Stucco-surfaced factory building gets protective coat of Buff THOROSEAL for longer life.

During renovation. Far right of Remington Rand factory building showing application of THOROSEAL, in contrast.



Voids, cracks and disintegration of stucco completely sealed against damaging rain and frost. THOROSEALING, as shown here, will eliminate maintenance and give years of lasting service.

Materials applied by Remington Rand Inc. Maintenance Department. Herkimer, N. Y.

Get our pictorially described literature
"HOW TO DO IT"
STANDARD DRY WALL PRODUCTS, INC.
NEW EAGLE, PENNSYLVANIA

DUCT FLOORS—A new 16-p booklet entitled, "Electrical Outlets Wherever You Need Them," gives complete details on R/C duct floors, a development which provides electrical flexibility for buildings at a low cost. As explained in the bulletin, R/C duct floors are standard reinforced concrete joist floors — with a network of electrical distribution ducts buried in the slab. Large pictures and diagrams in two colors aid in the explanation of details, design and cost comparisons. Free copies may be obtained from the **Concrete Reinforcing Steel Institute, 38 S. Dearborn St., Chicago 3, Ill.**

WIRE REINFORCING — A design manual covering use of welded wire fabric in reinforced-concrete building construction is available free to engineers and architects. Liberally illustrated with current construction pictures and diagrams, it has 44 pp and includes comprehensive design data and recommendations on many applications of fabric such as short-span construction, cinder concrete, tilt-up construction and Gunite. Other topics cover fireproofing structural steel, lightweight structural concrete, shrinkage and temperature reinforcement, and concrete slabs on ground. — **Wire Reinforcement Institute, Inc. Dept. 50, 1049 National Press Building, Washington 4, D.C.**

TUNNEL SUPPORTS—A new 8-p booklet (No. 569) explains the six advantages of Republic's forged steel wedge nut and rigid steel assembly for greater strength and safety in mine and tunnel roof bolting. It also includes data on forged square-head roof bolts; wedge-head bolts with rigid expansion shell; slotted mine roof bolts and roof bolt plates. For a free copy, write **Republic Steel Corp., Advertising Div. 3100 E. 45 St., Cleveland 27, Ohio.**

TWO-STAGE COMPRESSOR—A-C 2-stage sliding vane-type compressors are described in a new bulletin just released by the company. Built in various sizes to deliver air at pressures from 60 to 125 psi, the units are designed for low maintenance and constant efficiency. Also included is a table of ratings and outline dimensions of the units. Copies of the bulletin, 16B8244, are available on request from the **Allis-Chalmers Mfg. Co., 840 S. 70th St., Milwaukee, Wis.**

OVERSHOT LOADER—A 6-p brochure describes the five Austin overshot loader models 2-C, 4-C, 6-C, 7-C and 8-C. Action photos of each model are shown as with a large detail view of a typical machine, photos of hydraulic system components and a schematic piping diagram. Specifications and principal dimensions are also given.—**Austin Div. Central Ohio Steel Products Co., Galion, Ohio.**

TIGHT SQUEEZE

But Bucyrus-Erie 22-B Transit Crane Makes It Look Easy

This job, located along a narrow, tree-lined residential street in Pasadena, California, required the use of a compact clamshell-crane. A storm sewer trench had to be dug through tough decomposed granite and clay. Then, concrete pipe varying in diameter from 45 to 75 inches had to be installed.

The contractor on the job made the best possible choice: he put a Bucyrus-Erie 22-B Transit Crane to work. Assignments like this are tailor-made for this machine. It's easy to move around with its rubber-tired carrier — can work in tight, narrow quarters. You can use it, as this contractor did, for both excavating and crane work—clamshell, orange peel, and dragline are all operated on the regular crane boom. Above all, it's dependable—a machine you can count on for steady high production every time it starts a job.

Bucyrus-Erie Transit Cranes are available in two sizes — the 15-ton Model 15-B, the 25-ton Model 22-B. Your nearby Bucyrus-Erie distributor can give you complete information.

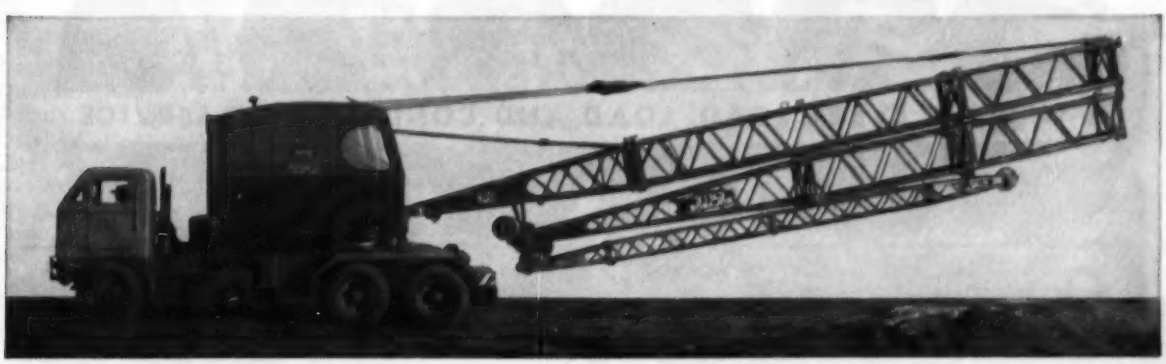
106E55

Power controlled load lowering is one of the features the operator likes best about this 22-B. It helps him set pipe into position quickly and accurately. The job is part of a 10-year flood control project in Los Angeles county.

Boom folding mechanism (optional equipment at extra cost) permits crane booms 60 feet and longer to be folded with jib suspended underneath for moves between jobs.

BUCYRUS ERIE

South Milwaukee, Wisconsin



Cut Downtime. . . .

on the St. Lawrence Seaway

INITIAL excavation for the Long Sault Dam on the St. Lawrence Seaway is right on schedule. On this project, as on all the excavation projects of the St. Lawrence Seaway, Firestone Nylon Tires are eliminating big downtime losses, giving more retreads and keeping tire costs at a minimum.

You can cut your costs with Firestone Nylon Tires because they are specifically engineered for the job. The treads give more traction and they are extra tough to resist cutting. Double-thick sidewalls give added protection against cuts and snags.

The new Firestone Safety-Tensioned Gum-Dipped* nylon cord body insures longer tire life and more retreads. The Firestone SafetyTensioned Gum-Dipped* nylon body gives the greatest protection against impact breaks . . . flex breaks . . .heat failures . . . and water damage.

Let your Firestone Dealer or Store show you how Firestone Nylon Off-The-Highway Tires will cut your downtime and increase your profits.

*Trade Mark Reg. U.S. Pat. Off.

A TIRE FOR EVERY ROAD, LOAD AND CONDITION OF SERVICE

GROUND GRIP • ROCK GRIP • GG WIDE BASE • ALL NON-SKID • ALL TRACTION • RIB EXCAVATOR

When you buy new equipment or replacement tires, specify Firestone

Enjoy the Voice of Firestone on radio or television every Monday evening over ABC

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SOME BIG CONTRACT AWARDS OF THE MONTH

Ebasco Services, Inc., 2 Rector St., New York City 6. Hydro-electric plant on Clark Fork River known as Noxon Rapids Dam, including 190-ft. high concrete and earth-filled dam extension, relocation for Northern Pacific R.R. tracks and roads, moving Rural Electrification Administration's Bonneville power and telephone lines, Montana, for Washington Water Power Co., W. 825 Trent St., Spokane, Wash. $79,500,000.

Consolidated Engineering Co., 20 E. Franklin St., Baltimore, Md. Plate glass plant on 603-acre tract on Potomac River 3 mi below Cumberland River, Md. for Pittsburgh Plate Glass Co., 632 Fort Duquesne Blvd., Pittsburgh 22, Pa. $34,000,000.

Macco Corp., 4409 S. Paramount Blvd., Paramount, Calif.; **Peter Kiewit Sons Co.,** 1024 Omaha National Bank Bldg., Omaha 2; **Stolte, Inc.,** 8154 San Leandro St., Oakland 5, Calif., and **Morrison-Knudsen Co., Inc.,** Box 450, Boise, Idaho. Connells and Beardsley power project (Tuolumne project) on the Stanislaus River, Sierra Nevada, Calif. for the Oakdale and South Joaquin Irrigation District, 322 D St., Oakdale, Calif. $31,200,000.

Dick Construction Co., Route 51, Large, Pa. Plants, warehouses, office, Penn-Lincoln highway, Pittsburgh, for Parkway Terminal Co., (Dick Construction Co. and Pittsburgh & West Virginia R.R.) c/o contractor. $30,000,000.

Joseph P. Blitz, Inc., 1 E. 57th St., New York 22. 43-story office building at 53rd and 54th Sts., New York City, for the 399 Park Ave., Corp. c/o contractor. $30,000,000.

Peter Kiewit Sons Co., 1024 Omaha National Bank Bldg., Omaha, Neb.; **Arthur A. Johnson Corp.,** 347 Madison Ave., New York City; and **Al Johnson Construction Co.,** Foshay Towers, Minneapolis, Minn. Iroquois Dam near Point Rockaway, St. Lawrence Co., New York, for The Power Authority of the State of New York, 270 Broadway, New York 7, N. Y. $13,957,018.

THIS *is the* CLAMP...

which meets the widest possible range of service on all types of heavy or light wall hose. The strongest of its kind, it is easiest to attach, provides a full-circumference grip on the hose; and can be used over and over again... always with the same sure holding power.

The "KING" *Hose Clamp*

SINGLE OR DOUBLE BOLT

Made of tough, durable malleable iron... completely rustproofed. Reinforced bolt lugs cannot bend out of shape. Full width tongue assures a perfect seal. Ears for vise jaws are also full width. On the double-bolt style, double-tongue saddles bridge the space between bolt lugs, assuring full-width compression over entire hose circumference.

"King" Clamps are made in Single Bolt style to fit hose from ⅞" to 5¼", and in Double Bolt style for hose from 3½" to 17¼". Double Bolt style is illustrated at right.

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DIXON *Valve & Coupling Co.*

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ROGERS TRAILER
Aids to Atomic Research

97 ton atom-smashing coil moved by R. R. Schubert of Butler, Pa. on a Rogers 75 ton capacity I beam trailer.

240,000 lb. synchro-cyclotron was hauled on a 75 ton capacity Rogers I beam trailer.

In this amazing scientific age there is a general inclination to accept progress with little thought as to the vast knowledge, skill and facilities required to attain it.

Take, for example, atomic development. Of basic importance is the scientific research. Next required are the engineering and mechanical operations to translate this knowledge into electrical and mechanical components. Then comes the *problem of moving these heavy, valuable parts to the laboratory.*

Consider the case of the Carnegie Institute's Nuclear Research Laboratory at Saxonburg, Pennsylvania. After a water trip of 3600 miles two expert riggers were engaged to move the atom-smashing coil and synchro-cyclotron from the waterfront to laboratory. Both of them entrusted their precious loads to Rogers Trailers.

YOU GET MORE FOR YOUR MONEY IN A ROGERS TRAILER

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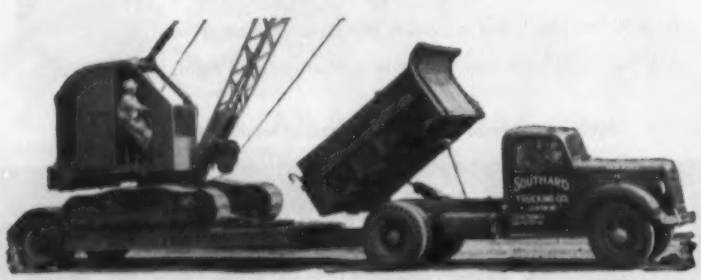


Attaching of loaded Rogers Tagalong trailer.

Advertisers in this Issue

Number of copies of this issue printed 41,981

A

Adams Div., LeTourneau-Westinghouse Co. 101
Aero Design & Engineering Co. 195
Air Placement Equipment Co. 104
Alemite Div., Stewart-Warner Corp. 155
Allis-Chalmers (Tractor Div.) 8, 9, 152
American Bitumuls & Asphalt Co. 176
American Bosch Arma Corp.
(American Bosch Div.) 13
American Manganese Steel Div.,
American Brake Shoe Co. 172
American Steel & Wire Div.,
United States Steel Corp. 132
Athey Products Corp. 191
Atlas Powder Co. 147
Austin-Western Co. 76, 77

B

Baldwin-Lima-Hamilton Corp.
(Construction Equipment Div.) 111
Barber-Greene Co. 28
Barco Mfg. Co. 41
Bay City Shovels, Inc. 86
Bethlehem Steel Co. 124, 156
Blaw-Knox Company
(Blaw-Knox Equipment Div.) 148
(Foote Construction Equipment Div.) 78
Borne, Scrymser Co. 114
Brunner & Lay, Inc. 170
Bucyrus-Erie Co. 187
Buffalo-Springfield Roller Co. 184
Butler Bin Co. 87

C

C & D Manufacturing Co. 159
Caterpillar Tractor Co. 23, 33, 34, 35, 36, 69
Chain Belt Co. 52
Chrysler Corp. (Ind. Engine Div.) 29
Cities Service Oil Co. 21
Clark Equipment Co.
(Automotive Division) 2nd Cover
(Construction Machinery Div.) 50, 51
Cleveland Trencher Co. 71
Construction Machinery Co. 110

D

Davey Compressor Co. 6
Dixon Valve & Coupling Co. 189
Dodge Div., Chrysler Corp. 138
DuPont deNemours & Co., Inc., E. I.
(Polychemicals Dept., Zerone-Zerex) 37
(Textile Fibers Dept. Cord) Nylon Tire 82, 83

E

Eimco Corporation, The 134, 135
Electric Tamper & Equipment Co. Inc. 157
Elis Equipment Co., Inc. 158
Euclid Div., General Motors 24, 25

F

Firestone Tire & Rubber Co. 188
Foster Co., L. B. 4

G

Gar-Bro Manufacturing Co. 26
Gar Wood Industries, Inc. 145
Garrett Corp., The
(AiResearch Industrial Div.) 160
Gates & Sons, Inc. 144
GMC Truck & Coach Div., General Motors 130
Goodall Rubber Co., Inc. 185
Goodrich Co., The B. F.
(Tire & Equipment Div.) 1
Gradall Div., Warner & Swasey Co. 98
Griffin Wellpoint Corp. 112
Gulf Refining Co. 31

H

Hercules Motors Corp. 182
Hercules Powder Co. 116
Homelite Corp. 45
Hough Co., The Frank G. 14, 15
Huber-Warco Mfg. Co. 117
Hughes Bros. Inc. 150
Hyster Co. 88

I

Ingersoll-Rand Co. 72
International Harvester Co., Inc.
(Industrial Power Div.) 92, 93
(International-Drott) 108, 109
(Motor Truck Div.) 192

(Continued on page 193)

Athey HiLoader Loads
2700 TONS PER DAY . . .

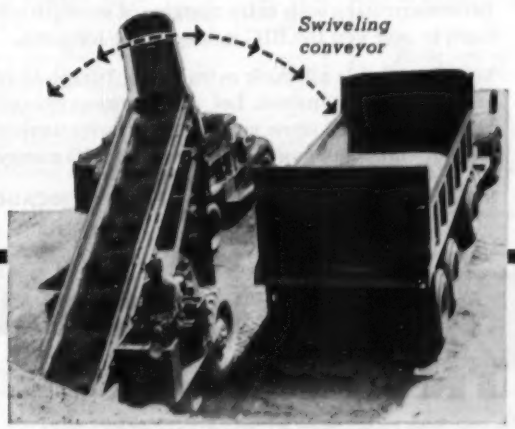
2700 tons per day is a lot of material for one machine to load . . . but *two* Athey HiLoaders handle a combined 5400 tons per day for Northwest Materials Corporation, Bryan, Ohio.

Satisfied? Here's what they say: "The feeder action on the Athey HiLoader gives a continuous flow of material from stockpile to the conveyor for high production and maximum efficiency in loading trucks. We are loading moist sand from stockpiles for base material on the Ohio Turnpike.

"The ability of the machine to load to either side, as well as directly behind, with the swinging conveyor, makes for quick and easy spotting of trucks without any lost time to the Loader or trucks.

"Our daily production is 2700 tons per machine per 10-hour day. The machines are easy to operate and are ideal loaders for high production from stockpile to trucks."

Another satisfied Athey owner talks straight from the shoulder, giving you reasons why it pays to own the Athey 125 HiLoader. Your Athey-Caterpillar Dealer will tell you more. See him soon!



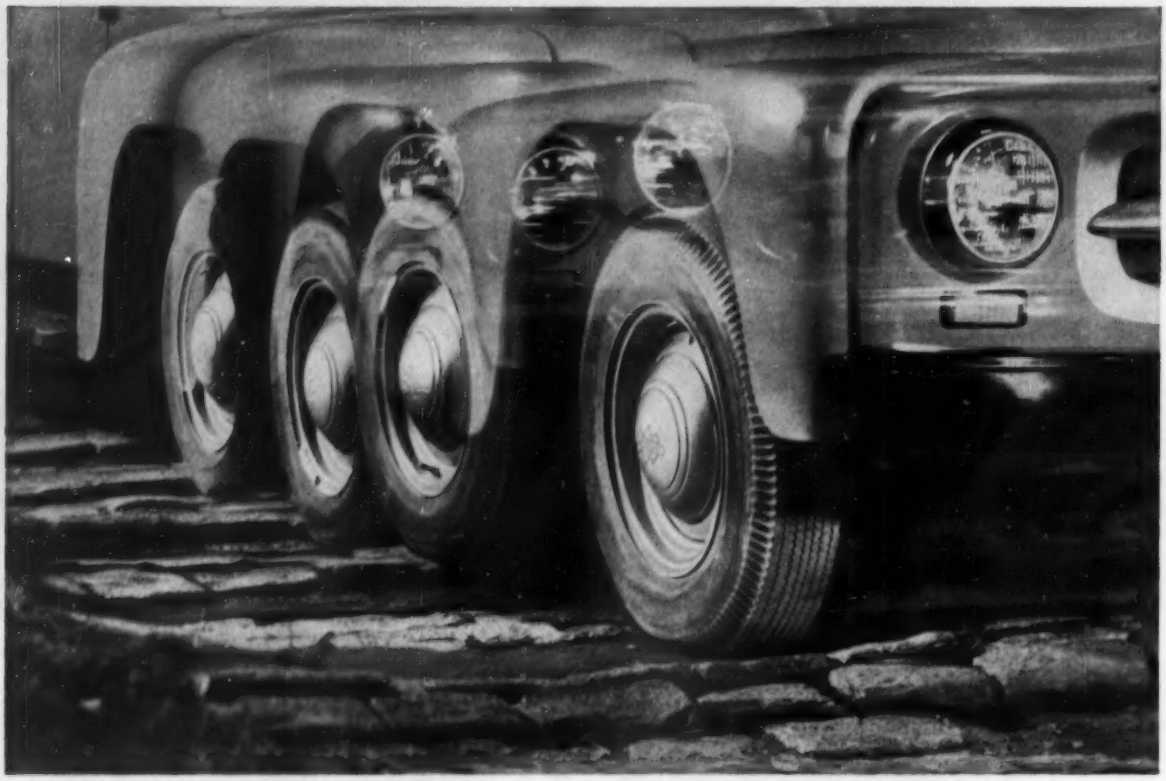
Athey

PRODUCTS CORPORATION

5631 W. 65th St.

Chicago 38, Illinois

1,400 crash landings a minute...



Here's a beating your truck will never have to take. This INTERNATIONAL Truck is pounding over the Belgian Block course . . . a torture track so bumpy that, at only 12 miles per hour, it slams wheels up and down 1,400 times a minute—so rugged that drivers are replaced every 20 miles of the 400-mile test.

You save the BIG money in construction hauling with all-truck built INTERNATIONALS. 200 basic models from 4,200 to 90,000 lbs. GVW—conventional and COE, 4-wheel, 6-wheel, four-wheel-drive. Axle and transmission ratios for every need.

to save you the BIG money

We torture INTERNATIONAL Trucks this way to be sure that sheet metal, cabs, springs and all running parts will stand up *longer*. So that our trucks will have utmost roadability, minimum wheel fight, maximum comfort. It's all a part of INTERNATIONAL engineering and design to save you the BIG money—the operating and upkeep money.

INTERNATIONAL engineers are never called upon to adapt passenger car engines or components. They design INTERNATIONALS with extra margins of strength—build them to save you the BIG money in the long run.

Yet with all this all-truck extra value, INTERNATIONALS are competitively priced. Let your INTERNATIONAL Dealer or Branch show you the right INTERNATIONAL for you—*all-truck built to save you the BIG money!*

INTERNATIONAL HARVESTER COMPANY • CHICAGO

All-Truck Built to save you the BIG money!

Top TV Comedy! Ronald Colman and Benita Hume in "The Halls of Ivy," CBS-TV. See your paper for date, time and channel.

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International Harvester Builds McCORMICK® Farm Equipment and FARMALL® Tractors...Motor Trucks...Industrial Power...Refrigerators and Freezers

Advertisers Index

(Continued from page 190)

Iowa Mfg. Co. 120

J

Jackson Vibrators, Inc. 157
Jaeger Machine Co. 16, 17
Johns-Manville 166
Johnson Co., C. S. 18, 19
Joy Mfg. Co. 49

K

Katolight Corp. 162
Koehring Co. 19
Kwik-Mix Co. 19

L

Laclede Steel Co. 183
LaCrosse Trailer Corp. 80
Lehigh Portland Cement Co. 167
LeRoi Div., Westinghouse Air Brake Co. 100
LeTourneau-Westinghouse Co. ... 123, 125, 127
(Adams Division) 101
Link-Belt Speeder Corp. 38, 39
Lone Star Cement Corp. 5
Luber-Finer, Inc. 26
Lufkin Rule Co., The 158

M

McGraw-Hill Book Co., Inc. 162
Macwhyte Company 3
Maisbary Mfg. Co. 149
Manitowoc Engineering Corp. 141
Marlow Pumps Div.,
Bell & Gossett Co. 107
Master Builders Co. ..... 3rd Cover
Master Vibrator Co. 178
Miller Electric Mfg. Co., Inc. 154
Miller Tilt-Top Trailer Co. 154
Minneapolis-Moline Co.
(Industrial Div.) 179
Moretrench Corp. 103

N

Nordberg Mfg. Co. 81
North America, Indemnity
Insurance Co. of 96
Northwest Engineering Co. 7

O

Oliver Corp., The (Industrial Div.) 97
Owen Bucket Co. 32

P

Pacific Car & Foundry Co. 161
Patent Scaffolding Co., Inc. 30
Parsons Co. 19
Phillips Petroleum Co. 105
Plomb Tool Co. (Proto Tools Div.) 2
Porter, Inc., H. K. 153
Prime-Mover Co., The 129

R

Roebling's Sons Corp., John A. 142
Rogers Brothers Corp. 190

S

Salem Tool Co., The 140
Sauerman Bros., Inc. 170
Shell Oil Co. 85
Sherman Products, Inc. 90, 91
Skil Corp. 113
Smith & Co., D. B. 162
Smith Co., The T. L. 42
Standard Dry Wall Products 184
Standard Oil Co. (California) 128
Standard Oil Co. (Indiana) 175
Stow Mfg. Co. 122
Stratex Instrument Co., Inc. 185
Superior Cement Tool Co. 73
Superior Concrete Accessories, Inc. 106
Superior-Lidgerwood-Mundy Corp. 176
Symons Clamp & Mfg. Co. 150

T

Templeton, Kenly & Co. 173
Texas Company 10, 11
Thermoid Company 121
Thew Shovel Co. 27
Thurman Machine Co. 181
Timken Roller Bearing Co. ..... 4th Cover
Twin Disc Clutch Co. 177

U

Union Wire Rope Corp. 46, 47
Unit Crane & Shovel Corp. 12

(Continued on page 194)

New "geodetic suspension" provides two-way protection

It has been proved that most fatal head injuries are caused by shock to the brain rather than injury to the skull. As a result, Cornell Aeronautical Laboratories patented this new type suspension for industrial safety hats.

This new feature is available only in WILLSON "SUPER-TOUGH®" SAFETY HATS AND CAPS.

It affords extra comfort as well as maximum protection . . . *inside and out!* For example, a blow no longer concentrates its force on a small area at the crown of the head. Instead, "geodetic" crown straps are so located that the force of the blow is dispersed over the entire head area!

Moreover, a pneumatic cushioned sweatband makes the tough Fiberglas hat shell safer—more comfortable, too, because a series of metered, inter-connected air cells team up to absorb the force! Get complete details. Send coupon below for latest bulletin.

—Clip and mail coupon for latest head safety information.—

Please send me your bulletin on the new Willson Super-Tough® Hats and Caps with "geodetic" crown straps and "pneumatic" headband.

*NAME*_____ *TITLE*_____

*COMPANY*_____

*ADDRESS*_____

*CITY*_____ *ZONE*_____ *STATE*_____

More Than 300 Safety Products Carry This Famous Trademark

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Leaders in Research and Development of Safety Equipment Since 1870

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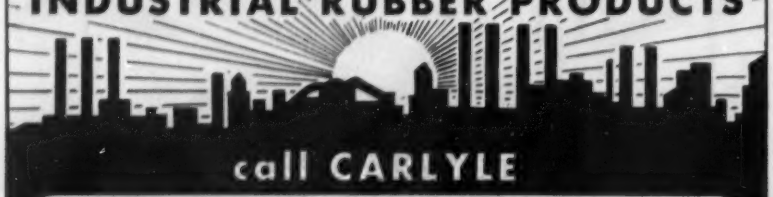

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For Sale After July

SEE IT IN OPERATION

Swings 350°! — Box Boom 80' Mast 58' Complete with Blocks.

Electrical 3-drum Hoist, Westinghouse 40 H.P. motor, G.E. Controller, Resistor Bank.

Contact W. I. GRANT, MERRITT-CHAPMAN & SCOTT CORP., 260 Madison Avenue, New York 16, N. Y.—ORegon 9-3500, For Description, Plans and Inspection.

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Learn latest methods to organize and run work. Prepare for the top jobs.

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GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
P. O. Box 921, Lake Worth, Florida

EQUIPMENT--used-surplus

FOR SALE

Newly Patented portable shallow water depth indicator, pressure activated, most accurate, ten day trial — refund three written guarantees. M-100: 0-25', $69.95. M-200: 0-50' $99.50. Custom models. Tel: Mr. Rich LO 73716. Aerco Industries, Box 996, Springfield, Mass.

The following equipment has been declared surplus and is available for immediate sale:

2 16" MC Fig. 6977 Single Impeller "A" Turbine Pumps Cp. w/65' Setting of 12" x 1-7/16" Column & Shaft w/20 x 12 Surface Discharge Heads Less Prelube Tank & Fittings w/12" Basket Strainers, w/60 H.P. 1750 RPM 3 Phase 60 Cycle, 440 Volts V.H.S. Motors w/N.R.R. complete with Magnetic Reduced Voltage Controls for 440 Volts.
Located—Durham Storage.

1 24" MC Fig. 6977 Single Stage Impeller "A" Turbine Pump w/65' Setting 16" x 2-3/16" Column & Shaft w/20 x 12 Surface Discharge Head Less Prelube Tank & Fittings w/16" Basket Strainer w/150 H.P. 1160 RPM 3 Phase 60 Cycle 440 Volts VHS Motor w/NRP w/1 Magnetic Reduced Voltage starter for 150 H.P. 3 Phase 60 Cycle 440 Volt Motor.
Located—Durham Storage.

1 32" MC Fig. 6977 6 Stage Impeller "A" Turbine Pump cp. w/65' Setting of 18" x 2-7/16" Column & Shaft w/30½" x 12" Surface Discharge Head Less Prelube Tank & Fittings w/18" Basket Strainer w/200 H.P. 860 RPM 3 Phase 60 Cycle 440 Volt VHS Motor w/NRR & 1 Magnetic Reduced Voltage Starter for 200 H.P. 3 Phase 60 Cycle 440 Volt Motor.
Located—Durham Storage.

1 Cedarapids Model 60 Compactor, complete with standard Hitch powered by International Model U-164 gasoline engine. Serial No. 15925.
Located—Sinnamahoning, Pa.

1 Model LA-88 (New) P&H Single Pass Stablizer equipped with General Motors Series 71, Twin 6, Diesel Motor, Model 12101.
Located—Durham Storage.

1 Euclid Model 7BV Loader complete with 24" offset hitch, with GM Diesel Engine. Serial No. 105 Engine No. 63-6A-5650.
Located—Maryland Storage.

1 Athey Model 3 Force-Feed Loader. Serial No. 03-L-1198.
Located—Durham Storage.

Write, wire or call Mr. J. Ray Rex

CENTRAL ENGINEERING AND CONTRACTING CORPORATION

Durham, N. C.

Advertisers Index

(Continued from page 193)

United States Envelope Co. (Cup Div.) 171
United States Steel Corp. 132
Universal Engineering Corp., Div., Pettibone Mulliken Corp. 116
Universal Form Clamp Co. 168

V

Vermeer Manufacturing Co. 144

W

Warner & Swasey Co. (Gradall Div.) 98
Wayne Shovel & Crane Div., American Steel Dredge Co., Inc. 180
Westinghouse Air Brake Co. (LeRoi Division) 160
Westinghouse Electric Corp. 163
Whiteman Mfg. Co. 89
Willson Products, Inc. 193
Willys Motors, Inc. (Kaiser Willys Sales Div.) 151
Wrought Washer Mfg. Co. 70

■

CLASSIFIED ADVERTISING

Frank J. Eberle, Ass't. Mgr.

Educational 194
Equipment (Used or Surplus New) For Sale 194

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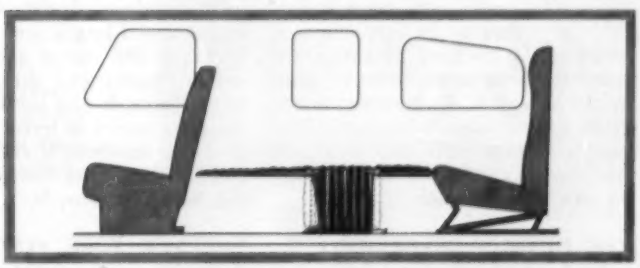
in the NEW, BIGGER AERO Commander 560-A

LONGER • ROOMIER • MORE COMFORTABLE

Twin-bed comfort is but one of the flexibility features made possible by the longer, roomier cabin of the new 5-7 place Aero Commander 560-A. The optional hassock seat unfolds in seconds to provide a seat back, a chaise longue or a comfortable bed for the flying executive.



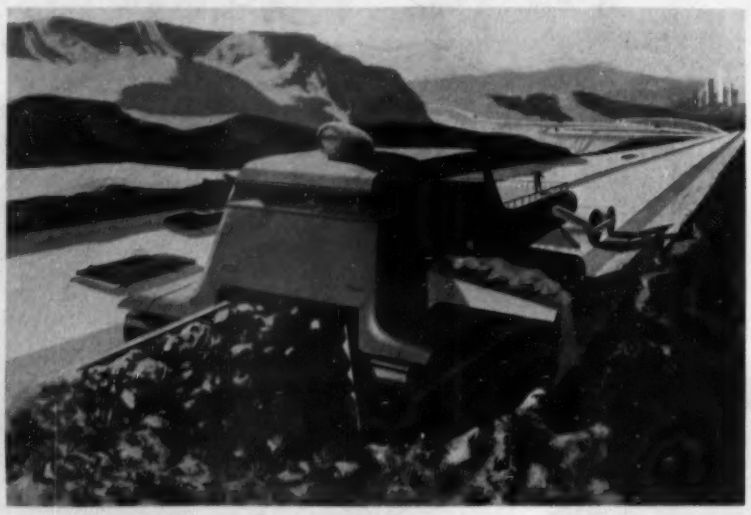
For complete information contact your Aero Commander distributor or write for Catalog 133-A

AERO DESIGN AND ENGINEERING COMPANY • TULAKES AIRPORT • P. O. BOX 118 • BETHANY, OKLAHOMA

Methods Memo . . .

A SPECTACULAR and informative exhibit of construction and road building equipment is promised at General Motors' 26-day Powerama which opens on Chicago's lake front on August 31. Included in the display will be shovels, earthmoving, drilling, grading, loading, ditching, compacting, mixing and paving equipment. The event will be open to the public at no charge.

YOU SUPERVISORS AND FOREMEN who get the jitters when you are called upon to make an occasional speech will be glad to know you can get some help from the National Safety Council. A booklet, "Speech Formulas," has just been prepared that shows you how to practice a speech, how to use the best voice, how to hold audience interest, and how to make the speech teach. If you or your boss are a Council member you can get it for 60c. If not, it will cost you $1.20. Write the National Safety Council, 425 N. Michigan Ave., Chicago, Ill.



"A RIBBON OF PAVING UNREELS as this roadbuilder of the future turns open country into superhighway." That's the way the New Departure ball bearing people described this scene in a recent advertisement under the general heading, "Highway Builder—1965?" Well, it won't come about in ten years or have this same configuration, but probably somebody will build it sometime, for there's no such phrase as "It can't be done" in construction.

THE PROGRESS OF father and son teams in the contracting business is always interesting to follow. In most cases the "old man" started from scratch, came up the hard way, and is sometimes reluctant to change some of his tried and tested methods. The son enters the business and, anxious to assume his rightful place, attempts to cut costs by introducing more modern methods and equipment that he believes will help. Sometimes it is pretty rough on the son, because the father takes the attitude "what was good enough for me should be good enough for you." Or sometimes it is "I made the money, and I'm not going to see you pour it down the drain on some wild and foolish idea."

Fortunately, most fathers are satisfied the son has a good head on his shoulders, knows the business and is perfectly willing to let him become a major part of the firm. This type of a father-son combination seems to make up the firm of J. W. Moorman & Son of Muskogee, Okla. This company has been in business more than 43 yr and you can read about one of their projects on page 84 of this issue.

THE MEXICAN GOVERNMENT has ordered a newly developed, completely mobile gas turbine power plant capable of producing 5,500 kw from the Clark Bros. Co. of Olean, N. Y. According to Clark, the Mexican Government will use the power plant, which is mounted in a single railroad car, on large construction jobs in areas where power is not readily available. Clark has just delivered its first model to the U.S. Navy's Bureau of Yards and Docks. The Navy plans to use its unit as an auxiliary power source in case of disaster at a Navy base. This power plant, capable of producing 8,000 hp, sells for slightly more than $1,000,000.

IF YOU'RE DOING WORK overseas, a book recently published by the United Nations may prove valuable. Called "World Weights and Measures," the 225-p handbook is an answer to the problem of translating U.S. units of weight and measure into their overseas equivalents. It lists international evaluations of length, area, volume, capacity, weight, energy and work, and specific gravity and density. Among other things, it also breaks down national currencies in terms of U.S. dollars. The handbook is available for $2 from the U.N. Book Store, U.N. Building, New York City, N. Y.

THE NEW YORK STATE Thruway Authority announced that revenue from the 396-mi road between Buffalo and Suffern topped a million dollars in June. The actual amount was $1,124,675.10. So far, since the road was opened in January, it has returned better than $5,000,000 in tolls. Just goes to prove motorists want—and will pay for—good roads.

HERE'S A LITTLE RUMOR that we can help Minneapolis-Moline Co. squelch. They are *not* being acquired by the Ford Motor Co., nor are they entering into discussions with any other company regarding sale or merger. This information was sent to us by W. C. MacFarlane, president and general manager of the M-M firm.

A MARKETLETTER that increasing numbers of contractors are finding valuable is McGraw-Hill's "Construction Daily." The service includes both job-reporting and newsletter sections.

The job reports (some 300 per day) list proposed work coming up throughout the country, bids asked, and results of bidding. Included are job description, location, owner, architect or engineer, and cost. The newsletter alerts you to changes in the market by analyzing major business movements and reporting trends in material prices, supplies (and shortages) wage and welfare agreements, and construction financing.

For sample copies of this first daily marketletter for contractors (which was established in 1923) write Circulation Manager, Construction Daily, 330 West 42nd St., New York 36, N. Y.

rigid concrete specifications here...

Views of Peribonka River Power Development.
Peribonka No. 1 Powerhouse—located at Chute du Diable, Quebec.
Owner: The Aluminum Company of Canada, Ltd., Montreal, Quebec;
Consltg. & Des. Engrs.: Shawinigan Engineering Co., Ltd.;
Contr.: Fraser-Brace Engineering Co., Ltd., Montreal.

engineers of Peribonka Power Plants employed POZZOLITH* to help meet requirements

Specifications for these important projects were rigid and exacting. Several types and classes of concrete were involved. Engineers insisted on adequate flow and workability without excessive bleeding or segregation.

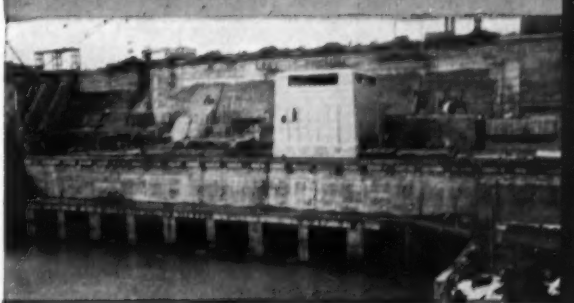
Field tests showed that despite problems introduced by air-entrapping sands, Pozzolith with its adaptations facilitated production of concrete of the specified qualities, and at a cost far less than by other known methods.

Pozzolith has proved to be an effective aid in producing excellent results and important savings on major jobs across America.

We would welcome an opportunity to work with you to help obtain similar results on your jobs. More details on these and other hydraulic structures in Master Builders Reporter No. 3 —48 pages, illustrated. Copy on request.

*POZZOLITH ... an admixture for concrete. Key to lowest possible unit water content for a given placeability. Added to the mix at mixer. Pozzolith and its adaptations permit close control of entrained air and rate of hardening to precisely meet job requirements.

Peribonka No. 1 Spillway—located at Chute du Diable, Quebec.
Owner: The Aluminum Company of Canada, Ltd.; Engineers and Contractor same as Peribonka No. 1 Powerhouse.



Peribonka No. 2 Powerhouse—located at Chute a la Savane, Quebec. Owner and Engineers same as No. 1 Project. Contr.: Pentagon Construction Co., Ltd., Montreal.

The MASTER BUILDERS Co

Subsidiary of American-Marietta Company

Crashing limestone—jolting road shocks, so they mounted the wheels on TIMKEN® bearings

45 tons of limestone come crashing into this big Easton tandem trailer, which then rides at high speeds over quarry roads to a cement plant.

All the jolting impacts are taken by the Timken® tapered roller bearings which support the wheels on the axles. And, rugged enough to take the heaviest shock loads, these bearings are also fine precision mechanisms.

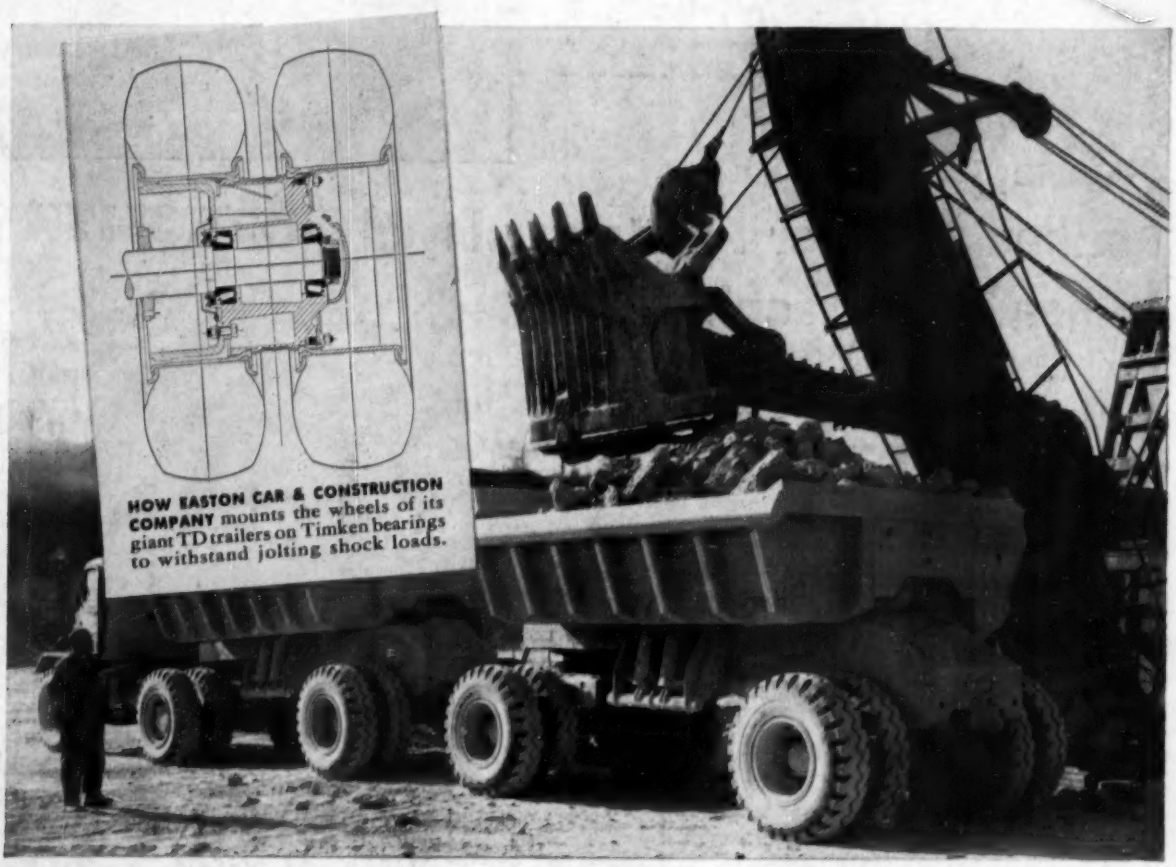
To get steel good enough for these bearings, we make our own—Timken fine alloy steel. To provide wear-resistant surfaces and shock-resistant cores, the bearings are case-carburized. They're tough on the inside, hard on the outside.

And Timken bearings have *inherently* high load capacity because the load is carried on a *full line contact* between rollers and races.

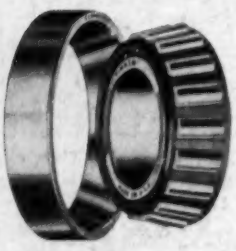
With these Easton trailers on the straight and level, the bearings withstand radial loads. But turning corners, the bearings also have to take sidewise *thrust* loads. The taper enables Timken bearings to take both radial AND thrust loads in any combination.

Timken bearings are a sure sign of quality on the equipment you buy—the equipment you build. Always look for the trade-mark "TIMKEN". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



HOW EASTON CAR & CONSTRUCTION COMPANY mounts the wheels of its giant TD trailers on Timken bearings to withstand jolting shock loads.



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TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

OUR OWN NICKEL-RICH ALLOY STEEL MAKES TIMKEN BEARINGS TOUGHER

Nickel makes steel tougher. And we don't skimp on nickel in the fine alloy steel we make for Timken bearings. Our steel-making specialists use the exact amount to give Timken bearings the toughness they need to withstand shock, last longer. We control the quality of Timken bearings at every step in production—from melt shop through final bearing inspection.

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION